4000
Gr45

........RANGE MANAGEMENT........

....OBJECT ...The upbuilding of a permanent, stable, and economic livestock industry by as complete utilization of the forage crop as is consistent with its sustained productivity and the protection of watersheds and other related resources.

PRIMARY FUNDAMENTALS OF RANGE MANAGEMENT

- Class.... or Stock....
  - FORAGE - Grass, Browse, weeds and mixtures..........
  - TOPOGRAPHY AND SURFACE - flat, rolling, steep...........
  - WATER - permanent, temporary, well distributed, poorly distributed
  - SOIL - light, heavy, loose, compact.........
  - ANIMAL PESTS - mosquitoes, flies, gnats.........
  - ? — GAME - Municipal watershed, irrigation projects.........
- Proper.... Numbers..
  - CARRYING CAPACITY
    - Based on less than average year
    - RANGE SURVEY....
      - FORAGE............
        - DENSITY
        - COMPOSITION
        - PALATABILITY
      - AREA IN UNIT
      - TOPOGRAPHY
    - ACTUAL USE - SEASONS, NUMBERS, CONDITION OF RANGE
    - COMPARISON - With areas on which C.C. has been established
  - CONTROL..........
    - To eliminate trespass
    - FENCING BOUNDARY
    - COUNTING IN - For bdy., div. fences, feed lots, seasonal ranges
    - ROUNDUP COUNTS - ON Y.L. RANGES
    - RECORDS - SALES, CALF TALLY
    - TRESPASS ACTION, ETC.
- Grazing... Period....
  - SEASONAL........
    - DEFERRED AND ROTATION GRAZING
    - VEGETATIVE READINESS.............
      - ALTITUDE
      - PRECIPITATION
      - EXPOSURE
      - FORAGE SPECIES
    - CLIMATE
    - TIME OF TEMPORARY WATER ON SOME RANGES
  - YEAR LONG........
    - SELECTIVE GRAZING
    - DEFERRED AND ROTATION GRAZING
- Distribution of... stock.....
  - SALTING
  - WATER DEVELOPMENT
  - FENCING
  - RIDING
  - STOCK TRAIL CONSTRUCTION
- Handling.. Breeding.. etc.......
  - ECONOMIC HERD
  - GOOD GRADE OF STOCK
  - SUFFICIENT SIRES
  - SEGREGATION OF SIRES EXCEPT DURING BREEDING SEASON
  - " " HEIFERS UNTIL TWO YEARS OLD
  - WEANING OF CALVES, VACCINATING, SUPPLEMENTARY FEEDING, ETC.
  - CULLING UNDESIRABLES
  - OPEN HERDING - S AND G
  - ONE TO TWO NIGHT BEDDING - S AND G

Bureau of Land Management
Library
Bldg. 50, Denver Federal Center
Denver, CO 80225

#922583460

ID88070508

HD
241
.U6
1938

UNITED STATES
DEPARTMENT OF THE INTERIOR
DIVISION OF GRAZING

INSTRUCTIONS FOR MAKING RANGE SURVEYS

Foreword

"Range Surveys" is a general term used by the Grazing Service to cover all work done in providing factual material for the use of administrative officers. The main divisions of the work consist of dependent property studies, the preparation of a map system, and an actual range survey. The various phases of the work will be taken up in the order named.

The purpose of these instructions is to standardize the methods to be used in the various regions to the extent necessary to obtain the desired accuracy and uniformity in results and to outline the policy of the Grazing Service for the conduct of grazing surveys. Conditions vary in the different regions so that it is impracticable to lay down absolute standard methods.

It may be necessary for each Range Examiner in charge of ECW areas to issue supplementary written instructions to his field men, based upon the principles herein outlined regarding methods not standardized by these instructions. Copies of such supplementary instructions should be sent to the Chief of Range Surveys for review before being sent to the field. The need for factual information in all Grazing Districts is so great and special survey funds are so limited, that the fullest use possible consistent with and in keeping with ECW regulations will be made of such funds when allotted.

OBJECT

There is an immediate need for all available information that will enable administrative officers of the Grazing Service to meet the objectives in the Taylor Act; namely, the conservation of the range and related resources; the integration and correlation between dependent properties and the public range is essential if serious complications are to be avoided. Also the relation between livestock production, range conservation and game conservation is an important part of our picture. As the demands for the various uses increase, conflicts will undoubtedly develop, the settlement of which will require accurate information regarding all the factors involved.

It is for the purpose of obtaining these basic facts, analyzing the various problems and from them developing a comprehensive plan for managing the various uses of the resources that grazing surveys are conducted. A complete survey should show what the grazing resources are, their physical condition, their relation to dependent properties and other resources, and how they may be best utilized, developed and improved.

The collection of field data, while essential, is of no greater importance than the training of the men who take part in the work. This

activity is essentially field laboratory work in range management. It involves every phase of range properties and resources, studying and analyzing problems, working out solutions and providing for the application of thorough going plans. In view of the recognized need for thoroughly trained range technicians, the importance of training in the conduct of survey projects should be stimulated in every way and adequately provided for.

RESPONSIBILITY

Chief of Range Surveys

The Chief of Range Surveys will have immediate charge of all Range Surveys, being responsible directly to the Assistant Director for the satisfactory management of all such projects. His function will be to correlate and standardize, preferably by field contact, the methods and practices of grazing surveys and to maintain a close contact with the ECW organization and the Washington Office. In order to provide proper allotment of funds for the work, plans for all projects involving the expenditure of funds for the work, either Regular or ECW will be worked out with the Range Examiner in charge in each ECW Region, each Regional Grazier concerned, the Chief of Range Improvements and the ECW Supervisor of each Region. Plans for the work will specify the intensity with which the field work is to be conducted, all of which will be taken up in detail by personal contact with the parties concerned.

Range Examiners in Charge

The Range Examiners in charge will be responsible for the preparation of the plan for conducting each project and will designate properly qualified men, not only to perform actual field work themselves, but to serve as chiefs of field parties where the plan indicates. He will also determine the degree of intensity with which the work shall be done; select and train the technical personnel. He will issue specific instructions to the men under him regarding the handling of each project and will visit such projects with sufficient frequency to make sure that the work conforms to a uniform standard from both the administrative and technical standpoint as outlined in these instructions.

It is absolutely important that the Regional Grazing Office shall furnish leadership and advice in determining standards to be met. The Range Examiner in charge will initiate the grazing survey projects in his region that are determined to be of primary importance after consultation with the Regional Graziers for whom the surveys are to be made. When such projects are initiated that call for work to be done exclusively by the ECW personnel it is desirable to have an experienced Grazing Service man demonstrate the methods in the field and give general directions for the carrying on of the same.

Regional Grazier

Grazing surveys, including both the field work and the compilation of the data gathered, is primarily a regional activity carried on to meet local needs. The responsibility for the quantity and quality of work will rest with the chief of each survey party and range examiners working independently under the direction of the range examiner in charge.

As the prime purpose of a range survey is to gather full knowl-

edge of the grazing resources and their best use, the members of the administrative personnel should use every opportunity to impart all of the information they have concerning those subjects to the project organization, as well as to gather at first hand all of the information they can from the surveys work. Such contacts should be specifically provided for in the Regional Graziers work plans insofar as practicable.

The Regional Grazier should maintain close contact with the actual field work in order that he may fully understand the methods employed in obtaining the desired information and the standards required. He should also familiarize himself with the mechanical methods of assembling and compiling data gathered by the field parties in order that he may readily apply such information when meeting with the various local Advisory Boards.

Range Examiners

All range examiners either Regular or ECW, will work under the direction of the Range Examiner in Charge of Surveys work, in each ECW area. They will be expected to work as individuals during the dependent property phase of the work, on the completion of which, they will when needed, become Chiefs of Parties engaged in reconnaissance. Their duties as Chiefs of Parties are outlined in detail under the section of these instructions covering range reconnaissance. They will be responsible directly to the Range Examiner in Charge of each ECW Region.

DEPENDENT PROPERTY SURVEYS

This phase of Range Survey work has been carried on during the past year in several different ways. In order that all work performed in the future will be uniform, the following instructions will govern:

Since the grazing service now has a corps of range examiners in the ECW setup and Range Surveys is an approved ECW work project, all dependent property studies will be made by the Division of Grazing Range Examiners, both Regular and ECW. Where the Division of Investigations has already been requested to make such studies by the Regional Grazier, the Special Agent in charge should be asked how soon he can complete the cases requested without interference with his regular work. If he cannot accomplish the work within the required time, the request should be withdrawn and the cases in question turned over to the Range Examiner in charge of that particular ECW region for completion. The request for the return of applications and the closing of such cases should be made in every instance by the Regional Grazier concerned.

All dependent property studies made to date on legal size forms will be copied onto the sample form appended hereto, (Supplement 1), as soon as practicable, and this form will be used in all work in the future.

The data asked for on the form will be secured for all dependent properties claimed by applicants by actual field examination on the ground and through actual contact with the applicant.

The Division of Investigations should be requested to furnish records of actual property ownership, taken from county records, and a record of state leases as shown by the State Land Offices. This data will be compiled in the manner and on the forms discussed under "Status Information".

Range Examiners will secure this ownership data in advance of making the actual examination in order to detect any discrepancies between the

U. S. Land Office, County or State records and the applicant's claim. In cases of conflict, the applicant will be required to submit evidence to the Examiner in the form of deeds, lease receipts, etc. Should the examiner satisfy himself in favor of the applicant, a note to change the status record should be made and sent in to the Drafting and Compilation Office as soon as possible. A set of complete instructions covering the use of this form, (Supplement 2), is attached and made a part of these instructions.

MAP SYSTEM

To date a vast amount of map material of primary importance to the Grazing Service has been assembled in the various regions, but unfortunately in a great many different forms, using varying legends.

In order to insure uniformity by regions as to map legends, the standardized legend is appended hereto, (Supplement 3), and all new work in all regions will conform. The following outline for the map system is mandatory and all regions making such maps will follow it to the letter.

The system calls for three tracings, any two of which may be printed simultaneously giving the map desired. The base map will contain all basic data of a more or less permanent nature and will be on a 1" to the mile scale, with the land net as control. The minimum data on the base map is as follows:

A. Topography
  a. Drainage, Springs, lakes
  b. Elevation by 100' contours (where available)
  c. Natural barriers, cliffs, etc.
  d. Sand dunes, malpais flows, badlands, etc.

B. Culture
  a. Roads
  b. Railroads
  c. Triangulation Stations
  d. Bench Marks
  e. Townsites
  f. Ranch houses and all other culture of a permanent nature.

Base map tracings will be prepared in each ECW area headquarters for all Grazing Districts coming under their respective jurisdiction.

The methods used in assembling such data in standard form will depend entirely upon the funds available, present form of such data and many other factors. For example, the Albuquerque Office has available photostatic prints of every surveyed township in that region. There it is a matter of assembling into standard maps information contained on such prints, adding such data as may be later gathered by reconnaissance parties. The Reno and Salt Lake City offices have base maps of practically all districts within their respective areas, but on varying scales. There the first job with respect to base maps is to either enlarge or reduce by photostat or pantograph to the 1" scale and trace directly on to the base tracing. Needless to say this base map will be added to from time to time as field parties bring in additional information.

For convenience in handling in the field, base maps will be

assembled into sheets containing 32 townships, each sheet being 4 townships wide and 8 townships long. Each state will be divided off into map areas corresponding to the 32 township sheets and each sheet given an identifying number. Key maps showing the identifying number system will be prepared on a small scale preferably 1/4" to the township.

Status Information

Where the status maps for entire districts have not been made, the Division of Investigations should be immediately requested to furnish the necessary information for such maps as soon as possible.

Where status maps have been prepared, but not kept up to date, formal request should be made to the Division of Investigations to furnish the necessary data to bring the work done up to date and arrangements made to have all changes in status reported in the future in order that the information will be kept current.

All status information, after being entered on the atlas sheets will be assembled, using 1" scale on the standard size map sheets with sufficient land net ties to allow for printing the status tracing with either the base or grazing tracing.

The permanent office record of status will be kept on form 4-590 (G.L.O. plats), bound by Grazing districts using the color legend attached hereto, (Supplement 4). Instead of coloring the various tracts solid, the tract in question will be outlined in the standard color for each particular kind of status. Ownership records will be kept for each township, both the ownership in fee, homestead entries, or the possession of leases covering either state or private lands in the space at the left of the township plat captioned "Remarks". A simple number legend will be used to show ownership. For example; If John Jones owns section one, a small figure 1 will be placed in section one and on the first line under "Remarks" the notation "1 - John Jones, Elko, Nevada", would appear. If a year from now Jones sells his tract of land to George Farr and 26 entries have already been made on the ownership record, the small figure 27 would then be made under the figure 1 in Section one and the entry on the left would read - "27 George Farr Purchase - 5/14/37", thus showing that on May 14, 1937, George Farr purchased section one from John Jones. In the event of changes in leases, the word "lease" should be substituted for "purchase". All identity numbers should be placed in the upper right corner of the tract in question.

Since it is obvious that some record must be made of range improvements placed upon the public domain either by individual permittees, associations or by the Division of Grazing Improvement Program, the location of each improvement will be shown on the status plats with the appropriate symbol for that improvement. The same symbol of identifying numbers as outlined for status ownership will be used, to-wit: If the symbol for a reservoir appears in section 1 with the #5 immediately adjacent, by looking at line 5 on the left hand side of the plat the ownership of that particular improvement will be found. It is appreciated that this will involve a great deal of work in keeping it current, but it is of extreme importance to the stockmen, Advisory Boards and the Division of Grazing, and therefore must be done.

Arrangements should be made with the Special Agents in Charge in each region to furnish ownership records as outlined above, if not already available, and to keep such information current in the future. If the Division of Investigations cannot supply the desired information, arrangements

will have to be made with County Assessors to supply it direct.

Grazing Information

Use will be made of all range type maps available, either from work already accomplished by other agencies, such as the Geological Survey, Soil Conservation Service, State Extension Services, State Universities, etc. Such data should be assembled on 1" scale on the standard size map sheets with sufficient land net ties to allow for printing the grazing tracing with the base on status tracing.

The Grazing Tracing will contain:

A. Forage types and subtypes

B. Forage data

C. All range improvements such as:
  a. Water developments
  b. Fences
  c. Corrals
  d. Lambing Sheds
  e. Dipping Vats
  f. Irrigation canals furnishing stock water, and all other improvements used in connection with the livestock industry.

Again, this tracing will be prepared in conformity to the standard map legend, (Supplement #3), copy of which is made part of these instructions.

Where existing type maps do not contain full information as to range improvements, the data taken from the dependent property studies should be entered upon the grazing tracing pending an actual range survey.

In the event that the forage data available is several years old, and it is presumed that there may be a distinct change in values, a sufficient number of types should be checked in order to supply a correction factor before furnishing such data to Advisory Boards. This check must be made by qualified, experienced Range Examiners, using the transect method,which will be explained in detail in a supplement to these instructions.

In all cases, however, particularly so since men with only limited training are being used on surveys work, the fact should be stressed that the carrying capacities gathered are not by any means considered absolute. It should be kept in mind that all carrying capacity estimates, no matter who has made them, furnish only a basis from which to work, and that actual use on the ground will give us the only real carrying capacity information.

CARRYING CAPACITY SURVEY

Preparation for Field Work:

When it becomes necessary to obtain carrying capacity estimates by an actual range survey and the project has been approved by the Chief of Range Surveys, plans should be perfected so that everything will be in readiness on the date set for starting the field work. The Regional Grazier should be notified as early as possible of the starting of the project, in order that he

may furnish all information at his command and not in the possession of the Branch of Range Surveys.

It will be necessary in all cases before inaugurating any projects, that the Range Examiners or special selected foremen be thoroughly trained in the rudiments of range reconnaissance. This will be done by assembling into one camp, preferably in groups not to exceed 8, the men who are to be chiefs of parties. These men will be given thorough training by the Range Examiner in Charge, in the conduct of actual range examination, following the instructions and standards as set forth in this Hand Book. At the completion of the training period these range examiners will be expected to become Chiefs of Parties, and will pass their training on to hand-picked crews of enrollees. These crews will consist of 6 enrollee field men and the cook, in addition to the Chief of Party. It must be kept in mind that enrollees cannot be turned loose to do actual range examination until such time as they have been given thorough training in actual field methods. Responsibility for such training is placed upon the Range Examiner in Charge, who will conduct a number of seminars to satisfy himself that the enrollees have sufficient knowledge and training to enable them to carry on the work under the supervision of the Chief of Party.

Before the beginning of field work, the responsible surveys man will obtain the necessary field equipment and assemble and review all available maps and other data that will be needed in the field, comprising the following:

1. Sufficient number of sets of topographic maps on the scale, one inch to the mile. If the available map is not on the desired scale photographic enlargements or reductions will be made in the Regional Office of Range Surveys and Compilation. Unmounted copies may be used by the examiners for typing in the field. Where maps are not available and the country is of such a nature that the grid iron method is followed, then blank township plats will be used. Several copies of the field map on the one inch scale printed or mounted on cloth should be secured for general reference purposes.

2. Status of lands to be covered.

3. Proper township assemblage by the Regional Office of Surveys for the area to be covered.

4. Location of known section corners and of as many as possible of such cultural features as buildings, fences, corrals, roads, trails, driveways, important water developments, telephone lines, etc., including locations by special surveys, particularly dependent property surveys.

5. Locations of and data on poisonous plant areas on which stock have been known to die periodically and which require investigation with a view to determining a plan to prevent further loss.

6. Names and classes of permittees, numbers and classes of stock grazed and allotments used.

7. Table of palatability for each class of stock of the important forage plants, expressed in percentages. This information, in the absence of a research branch of the Division of Grazing may be secured from agricultural colleges, Soil Conservation Service, forest range and experiment stations.

8. In connection with the correlation of grazing and other uses, the following information and data should be obtained where applicable:

a. Under timber use, the cut-over lands, lands being cut and lands proposed to be cut, planted areas and proposed plantations as well as a timber type map for field use if available. (Rarely present on Public Domain).

b. The value of each watershed as for municipal water supply irrigation or power; and areas closed to grazing or on which grazing is restricted for the purpose of watershed protection.

c. The population of each big game species; approximate range; seasonal use of areas; areas of introduced game; plans for handling, developing and utilizing; boundaries of refuges, present and proposed; and any restrictions on grazing to provide for game. In addition, careful notes should be made of the occurrence of smaller fur-bearing animals, upland-bird species, etc., and of the means by which grazing can be better correlated with the management and protection of these forms of wild life.

d. On districts where fire protection is important, it may be advisable to determine the areas of greatest fire hazard, general fire-trail plan and the fire-control plan.

e. Data regarding any areas used for experimental purposes.

The above data will be secured from whatever source available, preferably the Regional ECW Office, the Regional Grazier's Office or from any other reliable source. As much of the data as possible should be entered on one of the cloth or mounted maps for reference in the field.

Before the party goes into the field, the Chief of Party, preferably in the field, with the range examiner in charge and Regional Grazier should familiarize himself with the district or the part to be covered, in order that he may be able upon consultation with the Regional Grazier, to decide upon the place to start the work, the route for covering the district, the location of ECW camp side camps, camp sites in the event the enrollees are detached under per diem to cover isolated areas, general conditions and general phases of present administrative management.

Field Season

The type-classification work should not begin until the season is sufficiently advanced, that there will be a representative growth of forage on the ground. Insofar as possible, the work should be so organized that the lower elevations, where growth is earliest, will be covered in the forepart of the season, the higher elevations as growth advances, and other lower areas in the fall when the higher areas may be covered with snow. The work should continue in the fall until grazing or weather conditions prevent accurate classification.

Control for Range Reconnaissance

Base Map: A reliable topographic map is needed in the preparation of a grazing management plan of the highest type, and it also facilitates range examination. It is therefore highly desirable to have such a map. Topographic maps made recently by the U. S. Geological Survey or other organizations will usually serve as a satisfactory base for the grazing reconnaissance, and should be used whenever they are available.

If such a map is not available, the Office of Surveys and Compilation will in all probability have completed the base maps as outlined on page 4 and page 5 of these instructions. Only in the most urgent cases however, should survey funds be used for making topographic maps, and then only upon approval of the Chief of Range Surveys. In such instances, the topographic work may be done in connection with the range reconnaissance. If the enrollees have not had sufficient training in this phase of the work the range examiners will assist in cutting in secondary control from primary points using a plane table rather than turning the angles with a transit. Enrollees will then be trained in the "three point" method of mapping. This map may follow the mapping system known as "form line", which will include the drainage, outline of ridges and inaccessible cliffs and notes will be made of steep slopes, ridges and such other topographic features that affect range management.

Control It is necessary to have definitely located points on the area being covered in order to properly tie in the work. Every three sections, and preferably every two, should have an accurate tie point. If satisfactory Land Office Surveys have not been obliterated, they will serve admirably, provided they have been reconciled to the primary control and the topographic map.

Where maps are to be made or control points established, at least three points in each township should be permanently marked or monumented, and one point to every three sections should be marked in a sufficiently permanent manner in the course of the work to suffice for control during the range reconnaissance.

PROCEDURE IN THE FIELD

General Statement

It is impracticable to set up one arbitrary standard to which the field work on every project should conform. The general character of information obtained should not vary materially as between projects - it should be consistently accurate and reliable, but the intensity of the field examination and the amount of detail in the data may vary according to the importance and complexity of the grazing and related problems. All field examinations performed by the Division of Grazing will conform to three general standards, namely,

A. Reconnaissance: very extensive, usually consisting of cutting through each type once, and will give only a very general picture at best. All reconnaissance, since it is only a preliminary survey at best, will be followed by extensive or intensive survey as soon as practicable.

B. Extensive: A Rapid survey to be made usually where use of the range is not intensive or complicated. Typing usually down to 50 acres.

C. Intensive: A detailed survey which is essential where range use is quite intensive and complicated or where types are small and broken up. Typing usually down to 8 acres.

The amount of experience of the survey crew will determine to a degree the intensity of the work at the outset but as soon as the proficiency of the men will permit, the intensity of the work should be adjusted to the actual administrative needs.

If such a map is not available, the Office of Surveys and Compilation will in all probability have completed the base maps as outlined on page 4 and page 5 of these instructions. Only in the most urgent cases however, should survey funds be used for making topographic maps, and then only upon approval of the Chief of Range Surveys. In such instances, the topographic work may be done in connection with the range reconnaissance. If the enrollees have not had sufficient training in this phase of the work the range examiners will assist in cutting in secondary control from primary points using a plane table rather than turning the angles with a transit. Enrollees will then be trained in the "three point" method of mapping. This map may follow the mapping system known as "form line", which will include the drainage, outline of ridges and inaccessible cliffs and notes will be made of steep slopes, rims and such other topographic features that affect range management.

Control. It is necessary to have definitely located points on the area being covered in order to properly tie in the work. Every three sections, and preferably every two, should have an accurate tie point. If satisfactory Land Office Surveys have not been obliterated, they will serve admirably, provided they have been reconciled to the primary control and the topographic map.

Where maps are to be made or control points established, at least three points in each township should be permanently marked or monumented, and one point to every three sections should be marked in a sufficiently permanent manner in the course of the work to suffice for control during the range reconnaissance.

PROCEDURE IN THE FIELD

General Statement.

It is impracticable to set up one arbitrary standard to which the field work on every project should conform. The general character of information obtained should not vary materially as between projects - it should be consistently accurate and reliable, but the intensity of the field examination and the amount of detail in the data may vary according to the importance and complexity of the grazing and related problems. All field examinations performed by the Division of Grazing will conform to three general standards, namely,

A. Reconnaissance: very extensive, usually consisting of cutting through each type once, and will give only a very general picture at best. All reconnaissance, since it is only a preliminary survey at best, will be followed by extensive or intensive survey as soon as practicable.

B. Extensive: A rapid survey to be made usually where use of the range is not intensive or complicated. Typing usually down to 50 acres.

C. Intensive: A detailed survey which is essential where range use is quite intensive and complicated or where types are small and broken up. Typing usually down to 8 acres.

The amount of experience of the survey crew will determine to a degree the intensity of the work at the outset but as soon as the proficiency of the men will permit, the intensity of the work should be adjusted to the actual administrative needs.

Size, Organization and Qualifications of Party

Experience has shown that a party made up of a chief, six enrollee assistants and one cook constitutes the most efficient, economical and practical organization where the field work is done intensively. A larger party requires too frequent moving of camp and too much camp equipment. On the other hand, a crew of less than six enrollees cannot be handled with much less outlay for cook and moving equipment than is required for a party of six men. Of course the field men may do their own cooking, but such work slows down the actual field work and offsets any reduction in cost. These items as well as the size of the job, the accessibility of the country, the number of qualified men available, etc., should be considered in determining the size and makeup of the crew.

Chief of Party

The Chief of Party should be a man of good judgment, thoroughly trained in the technical work and with considerable administrative experience in grazing. He must be able to handle, train and direct his enrollees and cooperate with local administrative officers, Advisory Boards and stockmen. He should have gone through the training camp for examiners and be thoroughly grounded in surveys, field work and the compilation of data. He will be directly responsible for the conduct of the work on the ground and will be expected to lay out the work of the men in the field after their training period, see that the project plan and field methods are thoroughly understood and followed by the enrollees, train them to observe and analyze conditions, take measurements to secure uniform results, keep the data in proper form so that if necessary it may be turned over in understandable shape to a successor, order supplies when detached from a regular camp or side camp and maintain a careful check on expenditures. He should become thoroughly familiar with conditions, utilization and management on the area as a whole in order to be able to participate in the preparation of a comprehensive management plan at the completion of the project. At the close of the field season he should direct and aid in the assemblage and compilation of all data, and with the Regional Grazier prepare the management plans for the district or parts of the district covered.

The Chief of Party will designate the particular duties and work of each member of the party. Arrangements should be made to assign as much camp routine as possible to various members in order to relieve the chief of the greater part of such work and leave him free for the required amount of supervision and constructive work.

Other Members of Party

Enrollees with a natural inclination towards the work, preferably with some training in botany, geology and animal husbandry, with practical experience in range and livestock management, and with promise of fitting into the work, should be chosen. Because of the strenuous character of the work, especially since it is practically all done on foot, the enrollees should be in extra good physical condition.

By every means possible the whole party should be given an insight into the broader phases of the work, its purpose and the use of results. This is of utmost importance in arousing a personal interest in the work, which is so essential in maintaining a high degree of accuracy and efficiency. If a member of the party does not take a proper interest in the work it is advisable that he be replaced by an enrollee who will.

The cook fills a position of no mean importance in a field party. On him depends to a large extent the welfare and morale of the other members of the crew. He should be able to do good plain cooking in a sanitary and economical way, be willing to serve meals at whatever time the men get into camp and possess an agreeable disposition. He should assume charge and take care of all equipment in camp during the absence of the other men. Should the party be on detached service in regions so remote as to require packing the equipment, a separate packer should be chosen with particular reference to his proficiency in such duties and his familiarity with the region.

Field Methods

In order that the new men may early in the work gain a definite conception of the use to be made of the various data collected, all of the steps connected with the field work should be covered for a sample unit during the training period. For this purpose a suitable allotment should be selected as soon as the men become familiar with the mechanics of the field work.

Typing and note taking in the field will be done ordinarily by each man working individually as soon as he has demonstrated his fitness to perform such work. Each examiner should be provided with all equipment necessary. The chief of party will designate the units or areas to be covered by each examiner from each camp. The sections as shown on the Regional office assemblage will ordinarily be used as the units for the correlation of notes and type descriptions. In surveyed country the regular Land Office sections should be used. In unsurveyed territory the area should be sub-divided by imaginary section lines to correspond as nearly as possible with the section lines as they would fall, and each section should be numbered according to the Land Office method unless the topography is such that natural topographic units would prove more practical. Using the section as a unit for note reference does not necessarily require using the section as a unit of work in the field. Consideration should always be given to the topography in deciding the area to be assigned each examiner so that there will be no undue crossing of steep canyons or high ridges in covering the area, unless the type classifications would suffer through the adoption of such a course.

Mapping in the Field

The intensity with which types should be examined will vary considerably. The minimum requirement is that the examiner should see enough of each type to obtain a reliable estimate of its density and composition and to determine the various conditions that would affect the practical use of the type.

Where types are small or variable, or where grazing use is intensive, the areas should be covered on a basis equivalent to passing twice through each section and mapping at least twenty chains on each side of the line traversed, with sufficient offsets to obtain the necessary information for all the types, and properly map their boundaries. This means that the examiner will have been within one-fourth mile of every point on the area covered and will have covered it as much more intensively as is necessary to obtain the essential data.

In very rugged or barren country, or where the timber cover is too dense to permit grazing, the types need examination only to the extent necessary to be assured that no usuable feed areas are overlooked. Where the types are large and uniform, crossing the area the equivalent of once through each

section will be sufficient. Care must be exercised that no accessible pockets or other usuable areas of forage are overlooked. The examiner must decide in the light of his instructions from the chief of party when a basis of less than twice through a section is sufficient.

The procedure in mapping and examination will depend upon the accuracy and detail of the base map, the kind of control, the topography and the amount of detail to be mapped. If the base map is accurate, and if the type is governed locally to a large extent by the topography, the types and other data can be located and mapped with reference to topographic features by pacing a sufficient distance from known points to make the work reliable. Maps sufficiently accurate for reliable control are the exception. Only the U. S. Geological Survey quadrangles have been found accurate enough for use in this manner.

In all other instances where the preparation of a base map is not involved, the examiner will cross the area in a systematic manner by compass and pacing from established points, with checks on as many points as it is possible and practicable to make. On areas surveyed by the U. S. Land Office, if the work is not so old that most of the corners have been obliterated, and if the topographic map and the Land Office survey have been roconciled to each other, section and quarter corners will be used as control points, and section lines and centers of sections will generally be followed. If there are no Land Office surveys, or if such survey corners have been largely destroyed, other control points, either those located expressly for this purpose or monuments left from earlier topographic mapping, may be available.

The following data should be obtained by the examiner and shown on his field map:

Grazing Types: The area should be classified into types and subtypes and mapped in accordance with the outline given under the section on "Standard Classification of Forage Types". Such important areas as parks in dense timber, clumps of timber in parks, and other similar type changes down to 5 acres in size, if they are important landmarks, should be mapped. Unless some marked contrast of this character exists, a change in type of less than 20 acres should not be mapped. Special attention must be paid to the mapping of inaccessible areas which come under Type 7. Areas which are inaccessible only because of lack of practicable development and which may later be opened should not be mapped as Type 7, but they should be typed and their inaccessibility noted. If definite determination as to accessibility can not be made by the examiner, a note should be made of the area, and the case should be referred to the chief of party for final decision. As it is inconvenient to carry a set of crayons in the field, the types should be designated by number. Any areas not usable by domestic animals but available for game should be examined and a write-up made of the vegetation. Forage acres for game need not be computed unless there is immediate need for that information in game management plans. However, the density and composition of all plants used by game should be recorded in form which may be compiled when needed.

Soil Erosion: Accelerated erosion due to removal of virgin vegetative cover has attained such importance in all forms of land management that it is increasingly necessary to take it into account in range management. The Geological formation and the condition of the soil with respect to erosion should be carefully noted for each forage type. Any variation in the character or condition of the soil attributable to aspect or other topographic features should be reported. A summary of the erosion situation should be written for each management unit. From the information collected in the field

and otherwise available a soil and erosion map should be prepared as a basis for determining where control measures are needed and for correlating range management with soil management.

Topography: The topographic map should be checked in the field during the course of the work, especially as to the location of main drainages and main ridges. The examiner should revise the topography or add details if very noticeable errors or omissions are discovered on the topographic map.

Drainage and Watering Places: All drainage lines and watering places should be shown in the manner indicated in the legend. Special attention should be given to the exact location and mapping of water facilities for stock, as they are a controlling factor in range management. The examiner should check all the water on the original topographic map and add the minor watering places which frequently are omitted.

Culture: Buildings, fences, corrals, roads, trails, telephone lines and other cultural features should be accurately located, and those already shown on the map should be checked for location.

Alienated Lands: Time need not be spent in the field in accurately checking the boundaries of lands shown in the status record, as it is assumed that the survey of such lands is correct. Fences and other improvements on such land should be sketched in. If these lands are or may be used in connection with public domain range, they should be gone over and classified as though they were public lands.

General: Other data that should be shown on the map include: badly overgrazed and depleted areas, poisonous-plant areas that have caused or may cause losses of stock, areas infested with range-destroying rodents, areas inaccessible to stock, and salt grounds both satisfactory and unsatisfactory, as well as suitable locations for other salt grounds. If special notations, other than those included under the legend, are necessary in any district, they should be made by the chief of the party. Each examiner should be given a copy of the special notations, and they should be strictly adhered to. Special notations made on a field map for any area or unit should be recorded under heading "Special Notation" on the Type Write-up form, (Supplement 5).

In connection with the ECW activities and the general Range Improvement Program contemplated under the 25% fund, brief notes on suggested or recommended improvements such as areas needing rodent control, water development and fencing for various reasons,should be carefully noted in a separate legend and such information made available to the Range Improvement Branch of the Division of Grazing. It is appreciated that only through this manner may a general improvement program be worked up for future reference. It is suggested that blue crayon be used on the field maps to denote all such recommended work.

Field Notes

Type Descriptions - Each type and subtype will be written up on Form 1-340 to include the following:

1. Name of Examiner, Sec., T., R., Date.

2. Description of herbaceous and shrub vegetation, including:

   (a) Average density - the proportion of the ground surface actually covered by herbaceous or shrubby vegetation

within reach of stock, expressed in tenths, 10/10 indicating that the vegetation completely covers the ground.

(b) List of the important forage plants found on the type segregated according to the three classes - grasses and grasslike plants, weeds and browse, with percentage of the whole made up by each class; and with the relative abundance of each species expressed in percentages, Prominent worthless species should be listed separately and if desired, their abundance may be expressed separately.

(c) Palatability percentage of the type, i.e., the percentage of vegetation within reach of stock which is of value for forage.

(d) Forage factor.

3. Type comments, including:

(a) Soil - rock exposure, character of soil, depth, moisture, (dry, moist, wet), humus cover, character and extent of erosion.

(b) Adaptability of use - degree of suitability to cattle, sheep, game or other stock, and to common use, with reasons therefor.

(c) Proper season of grazing, from the standpoint of the value of the vegetation for the use required.

(d) Degree and extent of utilization expressed in percentages, overgrazed, undergrazed, properly utilized, eroded; reasons for the conditions.

(e) Poisonous plants or range-destroying rodents, if any are present.

(f) Damage to forage by fire resulting in changes in vegetation.

(g) Contributing factors affecting forage-acre allowance and any advisable restriction in the use of specific areas.

(h) Any desirable changes in present management to obtain best use of the type.

As soon as the examiner becomes proficient the specific comments listed under heading 4 (a) - (h) - - should be summarized for the entire area covered by him from one camp as a single unit.

Of the above headings it is believed all are self-explanatory with the possible exception of 2 (a), and 2 (c).

In estimating the average density, the spread of the vegetation above the ground must be carefully considered. The density of grasses should be

based on the spread of the grass, tuft or stem when it is grazed to the proper extent, with a consideration for its perpetuation, rather than on the full spread of the plant before grazing or on the total use of it. The density of more or less upright weeds should be based on the amount of ground that appears covered when the vegetation is viewed from directly above. In estimating the density of spreading weeds, the surface covered should be judged as when the stems are raised seventy degrees from tho horizontal. The density of browse should be determined by the portion of the ground covered by that part of the browse that is readily accessible to the stock. This may exclude from the estimate the interior or dense clumps. Any oak or other brush that forms an upper story beyond the reach of stock does not enter into the density estimate. Confusion sometimes arises in the minds of examiners where there is a double story of vegetation, as, for instance, if there is an open stand of oak within reach of stock with an understory of other vegetation. As this condition usually results from the crowns of the browse being open, the understory may be considered as merely filling in the openings. Care must be exercised that the density estimate represents an average for the type as a whole.

Palatability, as used in these instructions, is the degree to which the annual growth of herbage within easy reach of stock is grazed when a range is properly utilized under the best practicable range management. The percentage of the readily accessible annual growth of species that is grazed when the range is properly utilized determines the palatability of the species. As the palatability of individual species will vary with conditions, in order to determine the average palatability of a type, one should first estimate the palatability of each important species within that particular type - the class of stock, the composition of the vegetation, and the proper time for using the range as a whole all being considered. The palatability figure should then be multiplied by the proportion of the stand represented by the species. The addition of the resultant figures for all species will give the palatability of the type. This is the only accurate method of ascertaining the average palatability of the type. The percentage should not be in excess of what may be grazed under proper use and still allow the important palatable forage plants to maintain their stand and vigor year after year. As a basis for individual palatability figures a palatability list prepared under the direction of the Range Examiner in Charge will be furnished the Chief of Party. The list should be revised, if necessary, in the light of further careful observations.

Palatability estimates for a given type should be based upon the class or classes of stock which it is definitely planned will use the area. If common use is contemplated estimates should be made upon that basis. In view of the probability that in the future many allotments will be used by a class of stock different from that immediately contemplated, a converting factor should be determined which will specify the relative capacity of each general type-class for the two principal classes of stock which may be allotted to the area covered by the surveys project.. The converting factor should be determined after the field data have been compiled. Separate carrying capacity estimates should be made for game animals, based also upon a converting factor determined for each main type.

The forage factor for the type is the product of the average density of the type times the palatability. This should be determined in the field in order to fix more clearly in the minds of the examiners the forage value of each type and to prevent any discrepancies in "jibing" the parts of the same type examined by different men.

Other factors, such as vigor and volume of growth, continued growth based on the spread of the grass, tuft or stem when it is grazed to the proper extent, with a consideration for its perpetuation, rather than on the full spread of the plant before grazing or on the total use of it. The density of more or less upright weeds should be based on the amount of ground that appears covered when the vegetation is viewed from directly above. In estimating the density of spreading weeds, the surface covered should be judged as when the stems are raised seventy degrees from the horizontal. The density of browse should be determined by the portion of the ground covered by that part of the browse that is readily accessible to the stock. This may exclude from the estimate the interior of dense clumps. Any oak or other brush that forms an upper story beyond the reach of stock does not enter into the density estimate. Confusion sometimes arises in the minds of examiners where there is a double story of vegetation, as, for instance, if there is an open stand of oak within reach of stock with an understory of other vegetation. As this condition usually results from the crowns of the browse being open, the understory may be considered as merely filling in the openings. Care must be exercised that the density estimate represents an average for the type as a whole.

Palatability, as used in these instructions, is the degree to which the annual growth of herbage within easy reach of stock is grazed when a range is properly utilized under the best practicable range management. The percentage of the readily accessible annual growth of a species that is grazed when the range is properly utilized determines the palatability of the species. As the palatability of individual species will vary with conditions, in order to determine the average palatability of a type, one should first estimate the palatability of each important species within that particular type - the class of stock, the composition of the vegetation, and the proper time for using the range as a whole all being considered. The palatability figure should then be multiplied by the proportion of the stand represented by the species. The addition of the resultant figures for all species will give the palatability of the type. This is the only accurate method of ascertaining the average palatability of the type. The percentage should not be in excess of that may be grazed under proper use and still allow the important palatable forage plants to maintain their stand and vigor year after year. As a basis for individual palatability figures a palatability list prepared under the direction of the Range Examiner in Charge will be furnished the Chief of Party. The list should be revised, if necessary, in the light of further careful observations.

Palatability estimates for a given type should be based upon the class or classes of stock which it is definitely planned will use the area. If common use is contemplated estimates should be made upon that basis. In view of the probability that in the future many allotments will be used by a class of stock different from that immediately contemplated, a converting factor should be determined which will specify the relative capacity of each general type-class for the two principal classes of stock which may be allotted to the area covered by the surveys project. The converting factor should be determined after the field data have been compiled. Separate carrying capacity estimates should be made for game animals, based also upon a converting factor determined for each main type.

The Forage Factor for the type is the product of the average density of the type times the palatability. This should be determined in the field in order to fix more clearly in the minds of the examiners the forage value of each type and to prevent any discrepancies in "fixing" the parts of the same type examined by different men.

Other factors, such as vigor and volume of growth, continued growth throughout the season, true feeding value, growth characteristics as affected by grazing, actual accessibility of feed, and many others enter into the problem of the extent to which stock will graze on a type. It is realized that they should be considered in estimating the forage factor. However, until satisfactory means of evaluating them have been developed, they will be noted and recorded in the field and the information used in connection with the adjustment of forage-acre allowances and carrying capacity estimates rather than for making changes in density and palatability estimates.

It is of prime importance in making estimates that the crew have a uniform idea of density and maintain uniformity throughout the work in a district. Every estimate of a type should be based on a mental comparison with an area of vegetation with 10/10 density and this standard should be clearly fixed in the mind of each individual examiner at the beginning of each season. With a common standard in mind, and with periodic checks by the chief of party, it should be possible to maintain uniformity among the estimates made by various members of the crew. This uniformity is essential if the data secured by the party are to serve the highest purpose.

A write-up of every type and subtype of the herbaceous and shrub vegetation, (see headings 2 (a) - (d) for each unit or natural topographic unit should be available. If the type or subtype is the same as that in an adjoining unit it will not be necessary to make a separate write-up for each type, but a reference should be added showing where the type descriptions may be found. Care should be exercised, however, that the write-up or cross reference be complete for each type in every unit and that cross references be made only to types within the immediate vicinity.

Type or subtype boundary lines should not stop at a section line when the sections are matched or "jibed", but should always close. Density estimates or forage-composition write-ups are not necessarily identical in the same type or subtype in adjoining sections, but there should be no considerable discrepancy without a subtype division line or explanation.

Section and Natural Topographic Unit Descriptions: Each examiner should comment upon the following topics for the unit or natural topographic unit he covers from each camp. The chief of party will make such a write-up for complete grazing allotments.

(1) General elevation, topography and drainage as they affect accessibility of range to stock, drainage systems, whether flat, rolling or rugged; depth of canyons; steepness of slope; rock exposures, slides, boulders, cliffs; general accessibility. Inaccessible areas will be outlined on the map. The usability, expressed in percentage, of any type when entire type can not be fully used because of steepness, etc., will also be recorded.

(2) Character of watering places (stream, lake, pond, spring, seep, well, tank, etc.): Permanent or temporary (if temporary, state usuable period); state of development and need for improvement or maintenance; nearest permanent water; character of country, particularly the slopes; surface necessary for stock to traverse in order to reach water; relative amount of water available as compared with carrying capacity of the range; when intermittent water dries up; recommended improvement or development.

(3) Range-destroying rodents: Important species of rodents, acreage infested and damaged, and location by type.

(4) Salting plan: Suitable salting places will be indicated on the

map. In addition, notes will be entered regarding present arrangements for salting on the area, recommendations will be made for changes, and the reasons therefor will be given.

(5) Handling stock: As much information as possible will be obtained and recorded about the manner in which stock are being handled on the area, including herding of cattle and sheep, bedding of sheep, condition of bed grounds, evidences of excessive trailing, and other phases of management, with recommendations of needed changes and reasons therefor.

(6) Range improvements: Present improvements on area, and those needed for proper handling of stock on the range - drift and division fences, corrals, bridges, trails, driveways and others.

(7) Game: Indications of game on the area, seasonal use by game, and other important matters regarding game welfare, as well as any grazing restrictions necessary for the welfare of game.

The chief of party will familiarize himself with each area and check up on all necessary data for preparing the management plan, but each examiner will also gather as much information as he can. This is primarily for two reasons. It gives each man training he would not otherwise obtain, and, especially if reasons for recommendations are given, he is led to think constructively, and the work becomes more than a mechanical undertaking. Furthermore, the examiner covers each area much more intensively than the chief of party, who then has a check against his own judgment.

All of the mapping and notes should be completed in the field and not left to be done in camp. Immediately upon return to camp the field notes of each unit may be filed in a 5 by 8-1/4 inch manila envelope,labeled with the proper section, township, and range numbers or with the name of the definite natural topographic unit, together with the examiner's name and the date of examination.

Transfer of Data to "Camp Map"

Transferring the data on the field map to the "camp map" should be done by the chief of party or under his immediate supervision. So far as possible, this work should be performed each day upon completion of the field work. The transferring will be done before camp is moved, in order that, if necessary, any wide discrepancies may be checked in the field.

Care will be taken that the types, subtypes and forage factors properly match those for adjoining maps. Forage-factor estimates should be checked in order that there may be no discrepancy without explanations or divisions into subtypes. The map may be properly colored with water colors; or each type clearly designated by a type symbol, type numbers, subtype designations, and forage factors should be written on each type; and any special notation used should be explained on the border so that the map may be self-interpreting. Whenever there is not enough time in the evenings for the completion of this work, the coloring may be postponed for the time being, but it is important that type line and all other data be transferred as the work progresses. Whenever men responsible for adjoining sections cannot agree on some point, the discrepancy will be referred to the chief of party. If in his judgment it is necessary in order to maintain the general efficiency of the work, he should personally settle the question by a field examination.

Plant Collections and Economic Notes

The work of collecting plants and recording economic data will go hand in hand with the surveys. During the first few days in the field, when members of the party are out together for preliminary training, as many as possible of important herbaceous and shrubby species growing on the part of the District occupied and not previously collected will be collected in triplicate. As the work progresses with the advance of the season, additional collections will be made, and as soon as practicable after the survey starts there will be a collection in triplicate or quadruplicate of all important herbaceous and shrubby vegetation growing on the part of the District covered. As rapidly as quantities accumulate, a detailed write-up should be made for each specimen from the field notes taken at the time the plant was collected, and the specimens should be forwarded to the Western Headquarters Office. One set (unmounted) will be sent to Washington for identification, and the other two or three sets will be retained. After the identifications have been received the retained sets will be mounted. One of these sets is to be filed in the Regional Grazier's Office; another is to be kept in the Western Headquarters Office.

The party will be provided with copies of the flora with botanical keys that are best adapted to the region, and every effort will be made by members of the party to identify the plant species in the field. These identifications will be only tentative, as final identification will be made in Washington; but they will serve to make members of the party more familiar with the vegetation, and this identification will ordinarily be close enough for the correlation of common names. Common names and designations will be standardized as far as possible.

Common or scientific names, or standard abbreviations will be used in referring to the plants in the field and in listing them on the type write-up form, (Supplement 5), and all members of the party will adhere strictly to the accepted names and designations. (Supplement 8). Care should be taken that the names chosen are entered in a plant catalogue. After formal identifications have been received, the correct names, both common and scientific, will be correlated and listed in the catalogue.

Relative Forage Value of Range Plants

It is very important that members of the survey party learn the relative palatability of the principal range plants. Plants are eaten more readily under certain conditions than under others. Affecting palatability are such conditions as the combinations in which plants occur in the type, intensity of grazing, season in which they are grazed, mechanical features (awns, etc.) When the choicer plants have been grazed more closely, the less choice plants will be taken to a greater extent. The palatability estimate must take all those factors into consideration and be based on the proper degree of utilization under the best practicable management. Because of the many factors entering into the palatability estimates for any species, the percentage cannot be absolute but will often vary 10 to 15 percent for each class of stock. However, great care should be exercised not to deviate from well established palatability ratings on account of local conditions of utilization that may be due to poor management. As the survey progresses the palatability of the various species must be studied and revised with the approval of the Range Examiner in Charge to meet the conditions of the locality to which it is applied.

Training and Checks for Uniformity

Uniformity and accuracy in estimating density, forage values, and utilization are essential. The first week of the season and as much longer as necessary the crew, if made up of inexperienced men, will work together in the field for the purpose of training in the methods of work and in making uniform estimates. Each member will be assigned to individual work as soon as the chief considers him competent.

At intervals of three or four weeks throughout the season the crew will work an area together for the purpose of checking estimates and clearing up questions. Throughout the season the chief of party will continue individual training of crew members and make such additional checks on the work of each as may seem necessary. The chief of party must bear in mind that responsibility for training men rests largely with him.

Special Data to be Collected by Chief of Party

As the field work progresses, the chief of party will collect and record special map data and notes for each allotment or natural distribution unit for use in preparing the management plan, the object being to get the best line possible on all phases of range management while he is on the area and leave as little as possible to be figured out after he leaves the field. The chief of party should always correlate his observations closely with the Regional Grazier's knowledge of past conditions and use. These data will include:

(1). Notes on allotments, together with recommended changes in their boundaries. An allotment, as far as practicable, will comprise areas bounded by definable topographic or other features that serve more or less as barriers to stock and where stock may be handled and distributed to a large extent independently of management on other units. Existing allotment boundaries should not be allowed to obscure the best and most logical boundaries in view of all the facts derived regarding topography, degree of utilization, seasonal forage, distribution of water and other factors limiting the management of stock on the unit.

Allotments, if not already named, should be tentatively named according to some topographic feature such as a stream, ridge, or peak. Names already in use will be adhered to when they are distinctive and do not conflict with use elsewhere.

(2). Names of topographic and cultural features. This information can best be obtained from local Advisory Board members and settlers during the progress of the work.

(3) Information, by allotments or divisions, about numbers of stock and seasons permitted and grazed, with recommended changes; character and amount of drift, and recommended control of drift.

(4) Determination of the proper division of the range among the different classes of stock to be shown on map.

(5) Determination of proper grazing season for each division and the seasonal zones on which stock can be controlled with reasonable expense for fencing, herding or other control measures.

(6) Conditions of range and present degree of utilization of

different parts of each allotment; location and extent of areas overgrazed or eroded; location of injury to reproduction and degree of injury on each area; areas partially or totally unutilized, with factors responsible; past use of the range as it might influence changes or future use. The effect of these factors upon forage-acre allowance per head of stock should be considered. This will require correlation with needed range improvements, and methods of handling stock.

Areas to be covered late in the fall should be observed early in the season, and the degree of utilization of areas covered early should be checked during the latter part of the season.

(7) Methods of handling stock, present and recommended, including adequacy of present salting plans and desirable changes; range riding; methods of herding sheep, including bedding out and open herding, condition of bed grounds, etc. Conditions will be carefully noted and recommendations made to secure proper handling.

(8) Areas in need of revegetation and plans for assuring the protection necessary to obtain natural revegetation, as well as special areas in need of artificial reseeding, and plans for handling them.

(9) Information by allotments as to range improvements and water developments, covering the condition of present improvements, need for and cost of maintenance, and needed improvements for proper use of the range, with cost and relation of each project to forage utilization.

(10).Data on game, especially in relation to grazing. On Districts where game is an important resource and where there is now or later may be considerable conflict with the grazing use, the following points will be studied as closely as possible in connection with the surveys work.

(a) Correctness of population figures for big game animals.

(b) Adequacy of summer and winter range for game with respect to:

1. Available forage for game.
2. Grazing by domestic animals.
3. Settlement and fencing.
4. Adaptability of range now used.

(c) Habits and life history of game as far as they can be observed.

(d) Data on effect upon game of grazing by domestic stock.

(11.) Poisonous-plant problems. Acreage and species and seasons when important losses are occurring, class and approximate number of stock lost annually, general conditions surrounding use of the area, and possibilities of control and eradication.

(12). Changes in range management necessary to prevent undue interference with watershed protection or conservation and use of other resources.

(13). A full understanding of each Regional Grazier's grazing problems as influencing the use of the range and the principal administrative difficulties which might influence future use. This information is urgently

needed to enable the party chief better to analyze the management problem and to assist in their solution.

(14). An approximate idea of the amount of trespass and present means to control it, with possibilities of better means of control at reasonable expense.

Progress Report

At the end of the field season, the chief of party will prepare a progress report of the work done during the season, one copy of which will be furnished the Regional Office, one to the Chief of Range Surveys and one to the Washington Office. This report will include the following: Acreage and part of District covered, organization and qualifications of the crew, training given men in the field, methods used; recommendations for future work. The report will show in detail the various time expenditures - total time on field examination, office, herbarium, moving, noneffective days other than moving and average acreage covered in the field per day.

The progress report should be approved by the Range Examiner in Charge and transmitted in duplicate to the Chief of Range Surveys. After review by the Chief of Range Surveys, one copy of the report is to be transmitted to the Washington Office together with a copy of the Chief of Range Survey's comments to the Regional Grazier concerned.

DEVELOPMENT OF THE MANAGEMENT PLAN DATA

Following the field work, the data obtained will be compiled, and a plan of grazing management will be prepared. The management plan should be simple, workable, complete and of such a character that it can be kept up to date. It will be both graphic and written, consisting of base maps, overlay sheets, tabulations, written descriptions and recommendations for managing the range, handling the stock and coordinating grazing with the other uses of the District. It will include the best thought and judgment of the Regional Graziers and surveys men. Careful consideration should be given to the views of each permittee whose interests will be affected by proposed changes in management. In every instance, the Local Advisory Board's suggestions should be carefully considered and included in the plan when such views and suggestions are not contrary to the purposes of the Taylor Act or good range practice.

The final type-maps (Grazing Tracing), should show as clearly as possible the forage resources and the more permanent features that affect the use and management of those resources. The tabulations should show such items as the acreage and forage values of each distribution unit, with the authorized, permitted, actual and approved use. The written part should give the information on forage and its proper use that cannot be shown graphically or by tabulations, together with specific statements on the management of the range, forage resources and methods of handling the stock.

COMPILATION OF DATA

Grazing Tracing

The final map should be on a scale of 1 inch to the mile, and should be an accurate assemblage of the best map data available. The assemblage should

be made periodically during the field season or shortly after the close of it by the surveys organization if it determined any corrections that should be made. In order that the final map may be accurate, the field map should be carefully checked to see that all corrections and additions have been made and that everything is in form for the final record. The inking in or final preparation of the tracing should be done by the Regional Office of Surveys and Compilation. It should show topography if data are available, drainage, cultural features, land lines, water, and the names of streams, peaks, valleys and any other important permanent features. So much detail will be shown on this map that fine draftsmanship will be necessary. Coarse lines or lettering will be avoided as much as possible.

The forage-type lines, with type designations and acreages (surface and forage), and compilation unit lines with designations and acreages, should be put on a separate tracing, together with sufficient land line ties so that this tracing may be properly matched over the base-map tracing. Type lines on this tracing should be somewhat heavy, and dotted rather than solid to avoid confusing them with lines for other purposes. The location of type lines should be obtained by tracing them through from the camp map. All transferred data must be carefully checked to assure accuracy.

This plan of preparing two separate tracings permits the making of prints of the base map by the use of the first tracing alone, and these prints may be used for other than grazing maps. Prints showing type and unit lines, symbols and acreages on the topographic or drainage base may be obtained by having a copy made of the two tracings with one superimposed upon the other. This furnishes a negative from which prints may be made as needed.

Work on Compilation Map

The camp map tracing should be used as the work sheet. When this tracing is brought from the field it should show the Land Office assemblage, alienated lands, type lines, type designations, type values and allotment, seasonal zone and distribution unit lines. It will be used as the work sheet for planimetering and compilation.

Compilation Units

To facilitate adjustments of allotment boundaries and of management plans, forage data should be segregated by the smallest practical distribution units, ordinarily a section. Where topographic features do not form such units they should be outlined arbitrarily on the topographic base upon which previously have been entered the allotment boundaries and then traced through on the work sheet. Each compilation unit should be designated by name or number. Sections may be used as compilation units where considered advisable.

Planimetering

When the topographic compilation unit lines and assemblage map division lines have been put on the tracing, planimetering may begin. In this way planimetering may start soon after the field season ends, and the delay which would otherwise be caused by waiting for the final base map to be prepared will be avoided.

Areas of types will be determined within each section, or topographic compilatien unit. The total area of each section or compilation unit should be determined by the planimeter and checked with the Land Office Survey if this is available; then the types should be planimetered and totaled for the section be made periodically during the field season or shortly after the close of it by the surveys organization if it determined any corrections that should be made. In order that the final map may be accurate, the field map should be carefully checked to see that all corrections and additions have been made and that everything is in form for the final record. The inking in or final preparation of the tracing should be done by the Regional Office of Surveys and Compilation. It should show topography if data are available, drainage, cultural features, land lines, water, and the names of streams, peaks, valleys and any other important permanent features. So much detail will be shown on this map that fine draftsmanship will be necessary. Coarse lines or lettering will be avoided as much as possible.

The forage-type lines, with type designations and acreages (surface and forage), and compilation unit lines with designations and acreages, should be put on a separate tracing, together with sufficient land line ties so that this tracing may be properly matched over the base-map tracing. Type lines on this tracing should be somewhat heavy, and dotted rather than solid to avoid confusing them with lines for other purposes. The location of type lines should be obtained by tracing them through from the camp map. All transferred data must be carefully checked to assure accuracy.

This plan of preparing two separate tracings permits the making of prints of the base map by the use of the first tracing alone, and these prints may be used for other than grazing maps. Prints showing type and unit lines, symbols and acreages on the topographic or planimetric base may be obtained by having a copy made of the two tracings with one superimposed upon the other. This furnishes a negative from which prints may be made as needed.

Work on Compilation Map

The camp map tracing should be used as the work sheet. When this tracing is brought from the field it should show the Land Office subdivisions, allotted lands, type lines, type designations, type values and allotments, seasonal range and distribution unit lines. It will be used as the work sheet for planimetering and compilation.

Compilation Units

To facilitate adjustments of allotment boundaries and of management plans, forage data should be segregated by the smallest practical distribution units, ordinarily a section. Where topographic features do not form such units they should be outlined arbitrarily on the topographic base upon which previously have been entered the allotment boundaries and then traced through on the work sheet. Each compilation unit should be designated by name or number. Sections may be used as compilation units where considered advisable.

Planimetering

When the topographic compilation unit lines and management map division lines have been put on the tracing, planimetering may begin. In this way planimetering may start soon after the field season ends, and the delay which would otherwise be caused by waiting for the final base map to be prepared will be avoided.

Areas of types will be determined within each section, or topographic compilation unit. The total area of each section or compilation unit should be determined by the planimeter and checked with the Land Office Survey if this is available; then the types should be planimetered and totaled for the section or unit. If an error of ten acres or more per section occurs in the total type area as compared with the total section or unit area, the types should be replanimetered until the error is found and corrected. If the error is less than ten acres per section, it should be apportioned among the various types. A sample copy of the form used in compilation (Supplement 5-A) is attached.

Computation of Forage Acres

The type acreages should be inked in and the corresponding forage acres should be computed by multiplying the number of surface acres by the forage factor. The forage acres should then be entered in ink directly under the surface-acre figures.

Recording on Compilation Sheets

On the unit compilation sheets provided for the purpose, (Supplement 6), as much of the following data as is pertinent is then entered for each compilation unit:

1. Surface acres.
2. Surface acres of land not subject to Grazing Service control.
3. Surface and forage acres of Grazing land from which range stock is excluded.
4. Surface and forage acres of all types.
5. Surface acres of water (lakes, etc.)
6. Surface and forage acres of the total public domain range available for permitted stock.

The totals for the unit will be determined by types (vertical) and sections or compilation unit (horizontal), and the grand totals of these will be checked. This provides for finding and correcting errors in transferring the figures from the work sheet to the compilation sheet and for rectifying mistakes. It also gives the totals for the unit. These totals for each unit should then be entered on the work sheet directly under the number or name of the unit.

This method results in everything being recorded on the work sheet which it is necessary to put on the final Grazing Tracing map and makes possible the duplication of the final plan maps, should the latter be destroyed or lost.

The subsequent use that is made of compilation and work sheets does not justify having copies made, but the originals should be filed in a place safe from destruction by fire.

RANGE MANAGEMENT PLAN

After the completion of the field work on syrveys, a recommended management plan should be written after consultation with the Regional Grazier, members of the local Advisory Board and interested stockmen. The outline of the management plan which should cover an area not less than a complete allotment and preferably include an entire Grazing District, will be as follows:

SECTION I - General Description

Under this heading will be an accurate word picture of what actually exists on the ground at the time of the survey without particular regard as to the cause of conditions or their remedy. Wherever possible, refrain from statements that may be duplicated under the next two sections.

SECTION II - Past and Present Use

This includes the history of the land, the extent of its use in the past and its use at the present time and should include all phases of dry land and irrigated farming, mining, logging and fuelwood cutting, as well as livestock uses. Where the cause of conditions, good or bad, noted under Section I, can be traced to past or present use, it should be noted in this section.

SECTION III - Proposed Plan of Management

The actual range management plan will be under this heading. All recommendations for reductions in number of stock or change in class of stock or season of use and all recommended or proposed range improvements and management practices will be discussed here.

Headings in report will be only those used in this outline that are underlined.

SECTION I

General Description

I. Location and Status

1. State
2. County
3. Township and Range
4. Boundaries, fences, natural
5. Area in acres
6. Ownership (Private, Indian, Indian purchase, public domain, railroad, etc.)
7. Principal drainage system
8. Distance from cities or towns
9. Highways and railroads, distance from
10. Population, on and surrounding
    a. Economic conditions, very general
11. Range Survey
    a. Dates started and completed
    b. By whom made (men on party)
    c. Available maps and their source, or mapped by party.
    d. Erosion survey (if made)

II. Description of Area

1. Topography and Drainage
    - a. General - mountains, landmarks, rock outcrops, canyons, cliffs, slides, etc.
    - b. Elevations, range in
    - c. Principal drainage systems
    - d. Slops and exposure

2. Climate
    - a. General discussion (as related to land use)
    - b. Precipitation, temperatures, growing seasons

3. Soils and Geology

    Refer to the following in particular, general soil types, moisture penetration, water holding capacity, alkalinity, vegetative adaptations, etc.

4. Erosion
    - a. Water - degree and extent
        - 1. Sheet
        - 2. Gullying
        - 3. Finger or shoestring
    - b. Wind - degree and extent
        - 1. Sheet
        - 2. Dune formation
        - 3. Ridging
        - 4. Depressions

    A general discussion on conditions with particular emphasis on the relation between erosion, vegetation and range conditions. Discuss by major forage type as listed under 5-a - Vegetation.

5. Vegetation
    - a. Give an accurate description of grazing types and area of each, naming the principal species of vegetation, i.e., of grasses, weeds, browse, woodland and timber with particular emphasis on plants, volume growth and condition, reproduction and timber damage, range in densities, palatabilities and forage acre factors with estimated average of each.

    - b. Poisonous Plants - Discuss as a sub-heading of "5".

6. Water

    A general description of present stock water facilities both permanent and temporary, natural or artificial, with regard to streams, springs, seeps, wells and reservoirs. Make mention here of proposed or possible future developments.

7. Rodents
    - a. Kinds, prairie dogs, kangaroo rats, rabbits, etc.
    - b. Location and size of infested area in acres.
    - c. General description of damage and degree of infestation, heavy, medium, light, etc.

8. Predatory Animals
    - a. Kinds, coyotes, lion, bear, etc.
    - b. Damage

9. Wild Life
   a. Kinds, deer, elk, antelope, game birds and others.
   b. Relation of wild life to present use of the land.

10. Range Improvements

List and describe all present range improvements other than water, i.e., fences (boundary, drift, division) trails, dipping vats, corrals and any attempt at artificial revegetation, poison plant eradication or rodent control; also cabins, houses and permanent camps, horse pastures, etc.

11. Stock Driveway
Location and necessity - numbers of stock and time of use.

SECTION II

Past and Present Use

I. History of Area

1. Past use, how long used, and when first occupied; changes in ownership; class and numbers of stock grazed; mining, logging or farming operations; success or failure of various livestock activities; past land value per acre (selling price) if possible.

2. Former kinds and condition of vegetation if such can be determined; possible climax types.

II. Handling Stock (Present use only)

1. Numbers and class.
2. Season and period of use.
3. Herding practices, bedding out, trailing, etc.
4. Salting, amounts, where placed.
5. Breeding, sex ratio, time, supplementary feed, pastures for breeding stock, average calf or lamb crop.
6. Gathering and marketing practices, shipping points.
7. Trespass, cattle, horses, burros, sheep, goats.
   a. Sources of trespass and attempted control.
8. Inspection methods, if any.

SECTION III

Proposed Management Plan

I. Chief Value of the Land

For grazing, farming, watershed, timber, recreation, game, etc., in order of importance; adaptability of land to permanent grazing. Economic condition of livestock industry on area and vicinity; present selling price of the land per acre.

II. Objectives

General objectives of range management; specific objectives on this area or as applied to any sub-unit or units or particular part.

III. Livestock - Recommendations

1. Class of stock, adaptation and reasons.
2. Number of stock (carrying capacity).
    a. Forage acre requirement.
    b. Surface acre requirement.
3. Season of use.
4. Period of use.
5. Necessary reductions, if any, from present stocking, how and what to reduce.
6. Other desirable adjustments in present use.

IV. Grazing Units

Since most of the areas are considered as complete units and are divided into sub-units for management purposes, this heading can be disregarded in the majority of cases. However, should an area be of sufficient size or for some other reason, a division into distinct and separate range units is desired, this heading will apply.

(Unit descriptions and all other information and proposals can be handled under the sub-headings listed under "V - Sub-Units" in a very general way, dispensing with any great detail. Sub-units should come under their respective units.

V. Sub-Units

1. Location.
2. Boundaries, fences, natural, etc. - describe accurately.
3. Area in acres.
4. Topography and drainage in detail.
5. Soil and Geology, in brief.
6. Erosion, in brief.
7. Vegetation - Grazing types occurring and area of each, principal species, condition, etc.
8. Water - present supply and proposed developments.
9. Carrying capacity, season of use, period of use.
10. Range improvements, other than water, desired for this particular sub-unit.

VI. Handling Stock (Recommendations)

1. Distribution, deferred and rotation grazing, etc.
2. Bedding out.
3. Open herding.
4. Salt - amounts, distribution, etc.
5. Sex ratio.
6. Breeding season.
7. Lambing.
8. Supplemental feeding.
9. Gathering and marketing practices.
10. Dipping.

VII. Range Improvements

1. Water development, as summarized from sub-units; should be numbered in order of preference for entire area.
2. Fencing, pasture, drift, boundary, etc; give total by miles.
3. Trails, corrals, dipping vats, etc.
4. Rodent control, by kind, area, degree.
5. Predatory animal control.
6. Poisonous plant eradication.
7. Range terracing, contour furrowing, water spreading, etc.
8. Artificial revegetation.
9. Holding pastures.

VIII. Inspections, Reports, Records

1. Purpose.
2. By whom made, frequency, etc.
3. Information to be secured.

IX. Responsibility for Execution of Plan

Regional Grazier, other local administrative men, local Advisory Boards, local permittees.

GENERAL INSTRUCTIONS

Range Usability

Judging the degree to which a given range is usuable under a particular plan of management often requires greater knowledge of local conditions than the average examiner can be expected to have at the beginning of a grazing surveys project; and yet the degree of practical usability may be a determining element in arriving at carrying capacity and in planning distribution. For this reason it is of prime importance that the representative of the Regional Grazier's Office and the chief of party reach a definite understanding at the beginning of the project work regarding the limitations as to use of the representative types under the principal sets of physical conditions to be encountered. The chief of party will then be expected to see to it that other members of the crew adhere to this understanding when judging usability of specific types.

Plan Application

Too much emphasis cannot be placed upon the need for keeping the allotment management plans in current use. It is of special importance that the provisions of the plans be referred to when grazing applications are acted upon each year and when administrative plans of work for each field season are under consideration. The plan is the foundation of systematized use in the field and should be used as such. It should be consulted before rather than after action is taken.

Plan Revision

Although stability in management plans is greatly to be desired, the plans must be adjusted to the extent necessary to keep ahead of field action and entirely workable. Features of the plans which deal with the

history of range conditions, problems in management and their best solution, and basic forage and map data may be considered reasonably permanent. On the other hand, the actual use of the range is apt to change from year to year and specific measures for the betterment of range conditions must be modified to fit changing and unforseen circumstances. Therefore, the basic data in the plans and maps as outlined should not be subject to frequent change, but the current action section of the plans and corresponding map data should be kept up to date each year. This can be facilitated by including only permanent information on the base type map and data subject to change on the additional tracings.

Administrative Adjustments

The practical requirements of the stock industry will be considered as far as the perpetuation and use of the grazing resource permit. No recommendations should be made that would require immediate radical adjustments by the stockmen unless specifically authorized by the Director. The method should rather be that of working gradually toward the desired objective and giving the stockmen time to adjust their business. Recommendations should provide that within two or three years adjustments be carried far enough to prevent any further injury to grazing or other resources.

Grazing Capacity

The grazing capacity of a range unit will be the number of stock that a unit can support in good thrifty condition during the grazing season as established by the requirements of the vegetation itself without impairing the sustained productivity of the range and without undue interference with the use of other resources. Such factors as surface, soil, difference in palatability of adjacent types, range-destroying rodents, game, distribution and character of watering places, class of stock using the range, season of use, length of normal growing season, methods of handling, volume of growth, distribution of stock, poisonous plants, need of improving the vegetation, and special requirements of the area for watershed purposes all affect the number of stock the range can support properly, and must be taken into consideration in determining the number of forage acres that should be allotted each animal per month.

Areas that are inaccessible because of topography or because water is not available, and areas that must be closed for any reason, should be excluded in arriving at the estimated grazing capacity.

As the number of stock a range should support may change with the improvement of the range, the opening up of hitherto inaccessible range, a change in the management of stock, or the closing of areas for various purposes, the table for recording the grazing capacity of each allotment or division should provide several open spaces for future changes in keeping the records up to date.

Checks upon Carrying Capacity

Estimates of carrying capacity as determined from the survey data should be considered as tentative and subject to revision after trial and careful inspection. It is important that actual use records be kept for each allotment and that they be correlated with utilization estimates at the close of the grazing season. In order to have more definite measuring sticks of forage-acre requirements, specific carrying capacity projects conducted in the main forage types under representative conditions where the number of stock

and the period of use are accurately known should be initiated in connection with each grazing survey project and continued over a sufficient period of years to arrive at safe averages.

In cases where carrying capacity tests are already available for the types covered by the survey they may be used of course in lieu of initiating new projects.

Season of Use

The season in which the units should be grazed will be determined in accordance with such information as has been obtained from period studies, plant development records, and especially more intensive studies conducted by investigators on the relation between grazing and the growth functions of plants. In order that the opening date may be conservative long time weather records should be studied to determine the seasonal variations from year to year.

The plan will show the allotment of stock according to distribution units on the basis of the period during which each may be grazed and the grazing capacity for that period. The Regional Grazier must first consider the needs of the public range but the needs as to seasonal use of outside ranges and ranches also should be outlined both with a view to insuring more stability in that part of the livestock industry dependent upon public range and showing how the industry can be so adjusted as to meet the proper seasons on the public domain.

Distribution Plan

The basis for proper distribution of stock can best be determined, where forage-acre estimates are available and forage-acre requirements are known, by dividing the number of forage-acres in any given distribution unit by the forage-acre requirement for the season to be grazed. This figure will represent the number of stock that should be allowed to graze in that particular unit. Where the number of stock is in excess of the proper carrying capacity, the figure representing the forage-acres allotted per head would have to be correspondingly increased in order to provide for even distribution.

Handling Stock

The management plan will describe briefly the methods of handling stock employed on the unit and will recommend how stock should be handled with regard to herding, bedding, salting, watering, and all other phases of handling stock which affect the use of the forage.

Salting Plan

The management plan will show graphically the present satisfactory salting grounds with dates and amounts of salt. Recommendations on salting will indicate the amount of salt needed in different units, the approximate location of salt grounds or other facilities for salting, and the approximate time of use. The actual location of the grounds needed and the insertion on the salt map are administrative functions to be handled as soon as practicable by the Regional Grazier.

Provision for Game

The Regional Grazier's Office should furnish available information

regarding the extent to which different forage types may properly be used by big game species; also the management needs of game animals, fur-bearers and upland game birds with particular reference to the importance of conservative grazing upon the propagation of these species. This information together with the information collected by the surveys crew should be the basis for determining the extent to which game animals should be provided for in the management plans, pending the time when adequate game management plans can be developed.

Deferred and Rotation Grazing

This method of handling stock to be successful requires much better control than is ordinarily attained with cattle. No difficulty in this respect is experienced in applying the method on ranges used exclusively by sheep. Deferred and rotation grazing is needed particularly where depletion has gone so far that reseeding is advisable rather than depending upon the vegetative spread of plants already established and where moderate use under simpler management is inadequate to accomplish the desired results. Before deferred and rotation grazing is put into effect careful consideration should be given to all the conditions of management plant conservation and plant propagation to determine if the system is the best under the circumstances.

Allotments

The boundaries of allotments should conform as nearly as possible to natural topographic boundaries. A single cattle and horse or sheep allotment may include several natural topographic units or a single unit, depending upon the number of stock to be accommodated and the nature of the topography. Where several natural units are included these should ordinarily be divided into distribution units for guides in stocking and checking on the range. On sheep allotments these may be camp units.

Personnel

The compilation of surveys data and their general analysis up to the point of preparing the management plans will be done largely by the surveys men and in the ECW office of Surveys and Compilation. Pending the development of complete plans the surveys men will discuss their tentative recommendations in conference with the local officers and advisors and together they will formulate the plan of action for the coming year. This will provide the opportunity to correlate and coordinate the surveys data and the information of the local officers and advisors with the current permanent administrative plans, permit action sheets and grazing records. Together they will develop the complete allotment management plans.

APPLICATION OF THE MANAGEMENT PLAN

Responsibility for the application of the plan will reset upon the Regional Grazier. Once the plan is completed, recommended by the local Advisory Board and approved by the Regional Grazier it will become one of his administrative duties to apply it.

Administrative difficulties may make impracticable the immediate detailed application of the final plan. The attempt to apply it at once, if radical changes are necessary, might result in confusion. As outlined in the development of the plan, it will usually be better to secure such adjustments as can be made each year until the objective of the plan has been reached.

Within two or three years the adjustments should be carried far enough to prevent any further injury to grazing or other resources, The permittees should be notified as far in advance as possible of contemplated changes and the opportunity thus given them to adjust their business accordingly. Every effort will be made to secure all possible cooperation of the permittees in adjusting allotment boundaries and in determining assignments, numbers, and methods of handling stock. All adjustments made will have as their object the ultimate realization of the management plan.

Adjustments in Plan

Some adjustments in the plan itself will undoubtedly be found necessary after it has been tried out. This may be true more especially of the parts of the plan relating to grazing capacity and allotment boundaries. The grazing capacity estimates as first arrived at will be carefully tested by trial and by study. If the actual use records over an extended period of years supplemented by careful inspections indicate that the capacity of a range should be adjusted, the examiner should make suitable recommendations to the Regional Grazier. If the proposed adjustments involve changes in the capacities arrived at through the survey, the approval of the Chief of Range Surveys should be obtained before applying the adjustments.

Follow-up to Range Surveys

The Regional Grazier will be responsible for keeping the plan up to date. Each year he should show on his field maps additional information, water found, water developments, other improvements and all additional cultural features as well as suggested changes in allotment boundaries and other recommended changes in the plan.

For the first two or three years it may be advisable to have an experienced surveys man, (preferably one already in the organization who is familiar with the project), visit the Regional Grazier's Office and help him make the adjustments, keeping constantly in mind the needs of the forage and the eventual attainment of proper management.

If there are extensive changes in management, new supplemental grazing tracings will have to be made. The old maps will become a part of the records and should be filed. Field inspections should be made by members of the office of Range Surveys whenever it is deemed necessary, in order to determine the actual application and working plan on the ground.

STANDARD CLASSIFICATION OF FORAGE TYPES

In deciding upon a satisfactory system of types for classifying the range throughout the Grazing Service, two objects have been kept in view. These are: (1) To show by a glance at the color map as nearly as possible the general aspect of the range, and (2) to give, in addition to the general picture, as much detail as is consistent with the convenience of interpretation.

The first object is accomplished by classifying all of the lands into main types, each represented by a distinct color, the colors being chosen with a view to contrast and consequently to ease of interpretation. (On the

field map, types will be shown by number only). The second object is accomplished through the use of a system of subtypes. There are too many subtypes to permit the use of a color scheme or a scheme of hatching without confusion, and therefore letters are used for designating subtypes.

The general aspect of the range as it would appear to the examiner is the best guide in determining the type classification. The forage species are only occasionally conspicuous enough to contribute to the aspect of the range. If, for instance, an area supports enough browse to make it at once apparent that this species is the most conspicuous, the area would be classified as a browse type. There might be numerous grass or weed parks or small patches of coniferous timber less than 10 acres in extent that would be thrown into this general browse type. An untimbered range might support sufficient sagebrush to give the landscape a general sagebrush aspect. The sage might not be the most abundant species in the type, yet because of it was so conspicuous the area supporting the sage would be classified as a sagebrush type.

Designation of Subtypes

In using letters to designate the grazing subtype, no attempt will be made to show more than the very important forage characteristics of the type. Symbols for important species, however, should be used wherever possible rather than for classes, such as "Gr-Wd-Br". The more clearly the true picture of the vegetation can be shown, the more value it will have for the administrator. If grama, for example, is the predominating species, the subtype will be indicated by its designation, that is, "G". If the vegetation is made up of several important species, in equal amounts, as, for example, pine grass, clover and large huckleberry, with minor amounts of something else, the subtype designation would be "Pg-Cl-Lnb". If there is no predominating species or group of species, the class of vegetation will be indicated where advisable. If grasses, weeds and browse, with no decidedly predominating species, make up the subtype, the forage combination will be shown by the designation "Gr-Wd-Br", except that the respective designation for the class will be left out where the mixture is applied to the grass(type 1), weed (3), and browse (5) types.

No more than three combinations of letters will be used to represent grazing species in subtypes. Standard letter designations will be used where possible and others adopted should be included under the legend, and these should be adhered to as much as possible on each District to represent the species or combinations for which they stand. New designations as needed should be decided upon by the chief of party. If new designations are chosen, they should be as short as possible, preferably not more than two letters, and they should indicate as clearly as possible the names they represent. Care must be exercised that the same designation be not used for more than one plant species or group of species.

TYPES

Type No. 1 - Open Grassland other than meadow and secondary meadow.

Standard
Color
Formula

This general type includes bunchgrass areas, grama grass areas, and other open grasslands, not meadow in character, where grasses predominate. Weeds or browse, or both, frequently occur in mix-

```
......... Bril-
:       : liant
:   1   : yellow
:.......:  15
          drops
          1 oz.
          water
```

ture with the grasses, but the type color should be adhered to unless the area is more typically a weed or browse range. The mixtyre of grasses, weeds and browse can be taken care of by the subtype, as follows:

```
.........
:       :
:1-G-wds-
:.-Sb...:
```

Other subtypes in this and other types should be decided upon in accordance with instructions under "Designations of Subtype", except as specifically noted.

Type No. 2 - Meadows

This general type includes meadowland where sedges, rushes and moisture-enduring grasses are predominant, and the moist areas meadowlike in character, which occur usually as open parts in timber. The latter class are usually moist during early summer but become moderately dry by midsummer, and as consequence the predominating species are true grasses rather than sedges.

```
......... Cadmium
:       :  Orange
:  2W   : 25 drops
:.......:  1 oz.
          water
```

The wet meadow should be represented as:

```
.........
:       : Cadmium
:  2D   :  Orange
:.......:
```

The dry or secondary meadow as:

Type No. 3 - Weeds

```
.........
:       : Royal
:   3   : Crimson
:.......: 25 drops
          1 oz.
          water.
```

This type includes all areas where "weeds" predominate over other classes of vegetation. There is very little true weed type, as a weed cover is usually more or less temporary in character and is soon replaced by a more permanent type if the disturbing factor is removed. If there is no great predominance of the weeds over the grass or brush vegetation, and if it is possible to judge that the weed predominance is due to some unnatural factor, the weeds should be disregarded in designating the type, and the more stable vegetation should be used as an index.

The weeds will then be cared for in the subtype. For example: If a type is 40 percent weeds, 35 percent grasses and 25 percent browse, and if there is evidence of overgrazing, it should be designated "1 Wd-Gr-Br", which would indicate that weeds predominated at the time of the examination.

Type No. 4 - Sagebrush

This type includes all lands where sagebrush predominates. The sagebrush lands are usually of different range values and different in season of grazing from the areas which are listed below under browse. They are of a sufficiently distinct character to justify a color designation.

4
Stone
Brown
40 drops
1 oz.
water.

This and the browse type which follows are sometimes difficult to distinguish from the grass and weed types if aspect rather than the dominant class of forage is used as the distinguishing characteristic. Sagebrush may form only 15 percent of the total vegetation of a type and still its aspect may be that of a sagebrush type. It may prove desirable, in a given region, in order to avoid complications, to decide on a certain percentage of all the vegetation in the type, say 20 percent, as the minimum proportion of sagebrush that may be present if the region is still to be classified as a 4 type, providing, of course, it does not already have the aspect of some other type. The same will hold true of the browse type.

Type No. 5 - Browse - (Mountain Brush - Chaparral)

5
Olive
green
30 drops
1 oz.
water.

This type includes all untimbered areas where brush or shrub species except sagebrush or desert shrubs give the main aspect or are the predominant vegetation. Characteristically such types occupy the transition zone of the lower mountain slopes, foothill and plateau areas. Sagebrush and other desert shrubs a are so distinctive in range values and seasons of grazing use as to justify separate types.

Type No. 6 - Range in coniferous timber supporting grasses, weeds, browse, either singly or in combination.

6
Dark
green
40 drops
1 oz.
water.

This type includes all range in coniferous timber, except as provided under Types 7 and 9. The forage may vary from a pure stand of pine grass, or some other grass, to a pure stand of weeds or browse. It usually, however, is made up of grasses, weeds and browse, and the proportion of each varies so widely that it is not thought advisable to attempt a division into types with distinct colors. These variations can best be represented by subtypes. This type while exceptional in Grazing Districts, is found in some regions.

Type No. 7 - Waste Areas

7
Sky
blue
15 drops
1 oz.
water.

This type includes all areas of dense timber and brush which have no value for grazing or have such slight value that they cannot be economically used. This may be due either to denseness of standing or down timber or sparseness of forage growth. Large areas of very sparse forage, unless within easy reach of a better

type, will be classified as a waste area because of the impracticability of running stock over so large an area to get such a small amount of feed. Just what areas of this character should be classed as waste will have to be left to the judgment of the examiner as to the actual possibility of use.

This type also includes other waste areas not strictly in timber or brush and not barren which are so rough or inaccessible as to make their future use entirely improbable. Such areas are not sufficient in extent or importance to justify a separate color. This type is extremely rare in Districts.

7T	Waste areas in dense timber.
7B	Waste areas in brush.
7R	Waste areas whose rocky character prevents use.
7I	Permanently inaccessible areas.
7S	Waste areas due to scant forage, but not actually barren.

Type No. 8 - Barren

This type includes all areas on which there is naturally no vegetation, or practically none, such as intermittent lake beds which are dry most of the year, saline flats, active sand dunes, "slick" rock, shale or clay "bad lands", lava flows and "malapais" areas.

8	Blank

Type No. 9 - Areas of woodland, supporting grasses, weeds and browse, singly or in combination.

This type includes all areas, except waste, in the woodland timber type. The main timber species of this type are. juniper, pinion, oak and mesquite. These

9	Light green 20 drops 1 oz. water.	are given as a guide in typing the range. The character of the range in this type both as regards location, carrying capacity, and management, is sufficiently distinct from the main type in coniferous timber to justify a separate type color. The forage may vary from a pure stand of grasses, weeds or browse to a combination of any two or all. This variation can best be shown by subtype designations.

Type No. 10 - Aspen

10	Geranium pink - 20 drops 1 oz. water.	This type includes all areas on which aspen timber gives the characteristic aspect and appearance. As a rule either browse or grass understory will constitute the principle forage specie in this type.

Type No. 11 - Greasewood

11	Distance blue 20 drops 1 oz. water.	This type includes areas where greasewood is the predominant vegetation or gives a characteristic aspect. Characteristically this type occupies valley floors subject to overflow during flood periods or areas underlain with groundwater at shallow depths where the soil is more or less saline. It is sufficiently differentiated from other desert shrubs to justify an exclusive type.

Type No. 12 - Salt bush (Chamiso)(Salt bush) Shadscale)

12	Pearl Gray 20 drops 1 oz. water.	This type includes areas where the various salt desert shrubs of the A triplex family form the predominant vegetation, or give the characteristic aspect. There is sufficient significant difference in the range value and use of salt bush areas to justify their separation from other desert or semi-desert shrub types.

Type No. 13 - Winter fat

13	Sepia 20 drops 1 oz. water.	This type includes areas where winterfat (Eurotia) gives a charactertistic aspect or constitutes the predominant vegetation. Though commonly associated with other semi-desert shrubs, the occurrence of this plant in Utah and Nevada as a type character is of sufficient extent to justify a separate type.

Type No. 14 - Mesquite -

14	Yellow Earth 40 drops 1 oz. water.	This type includes areas where various species of the Mesquite (Prosopsis) give the characteristic aspect or constitute the predominant vegetation.

Type No. 15 - Creosote Bush

15	Bottle green 40 drops 1 oz. water.	This type includes areas where creosote bush -(Covillea) gives the characteristic aspect or constitutes the predominant vegetation.

Type No. 16 - Desert Shrub

16	Terra Cotta 20 drops 1 oz. water.	This is a general type which includes areas where other desert shrubs aside from those separated into individual types, constitute the predominant vegetation or give the characteristic aspect. This type includes several genera which are quite distinctive in type habit such as black brush (Coleogyne) Coffee berry (Simmondsia) Catclaw (Acacia) (Mimosa) and (Paloverde) but pure types of each are so limited in extent as to not justify separate types. The plant symbols used will be sufficient to indicate the predominant species present.

Type No. 17 - Joshua Tree

17	Light Tan 10 drops 1 oz. water.	This type includes all areas where Joshua Tree gives the characteristic aspect.

Type No. 18 - Cactus

18	Old Rose 20 drops 1 oz. water.	This type includes all areas where various species of cactus give the characteristic aspect or constitute the predominant vegetation.

NOTE: If the information on the base map will be obscured by adding the designated colors to Type 7, it will be permissible to omit the colors and depend upon the type symbols for their proper identification.

SUPPLEMENT #1.

UNITED STATES
DEPARTMENT OF THE INTERIOR
DIVISION OF GRAZING
Boise, Idaho,

Serial 048717

CONVERSION FACTOR OF FEED TO UNITS OFFERED FOR COMMENSURATE RATING

NAME John Doe DISTRICT 1 STATE Idaho

Type of Feed	C.M.	Tons	C.M.	Acres	C.M.
1-Ton hay (all kinds)	4	265	1060		
1-Ton alfalfa or clover chaff	2				
1-Ton bean straw	2				
1-Ton ensilage	2				
1-Ton grain (all kinds)	12				
1-Ton cull beans	4				
1-Acre hay stubble	1			65	65
1-Acre seeded, irrigated pasture	5			20	100
5-Acres dry pasture (protected)	1			1197	239
1-Acre wet meadow (sub-irrigated)	2				
1-Acre corn stalks	2				
1-Acre straw and stubble	1			145	145
3-Acres high mountain pasture	1			424	141
Total Cow Months*			1060		690

Livestock owned
Cattle 12
Horses 10
Sheep 600
Goats

Total --------
1750 CM or
8750 SM
Commensurate Rating: 12.3 months

*Sheep months converted ratio 5 to 1 - 710 sheep

REMARKS: Member of John Doe Community Band (John Doe, Tom Doe, Jim Doe, Ed Doe, Wm. Doe)

	Sheep
Owned & Leased farm land:	
Priority in Saylor Creek Unit	200
*Leased Range Land:	
Priority in Devil Creek & Cedar Butte Units (combined)	300
Priority in Three Creek Unit	176
Total	676

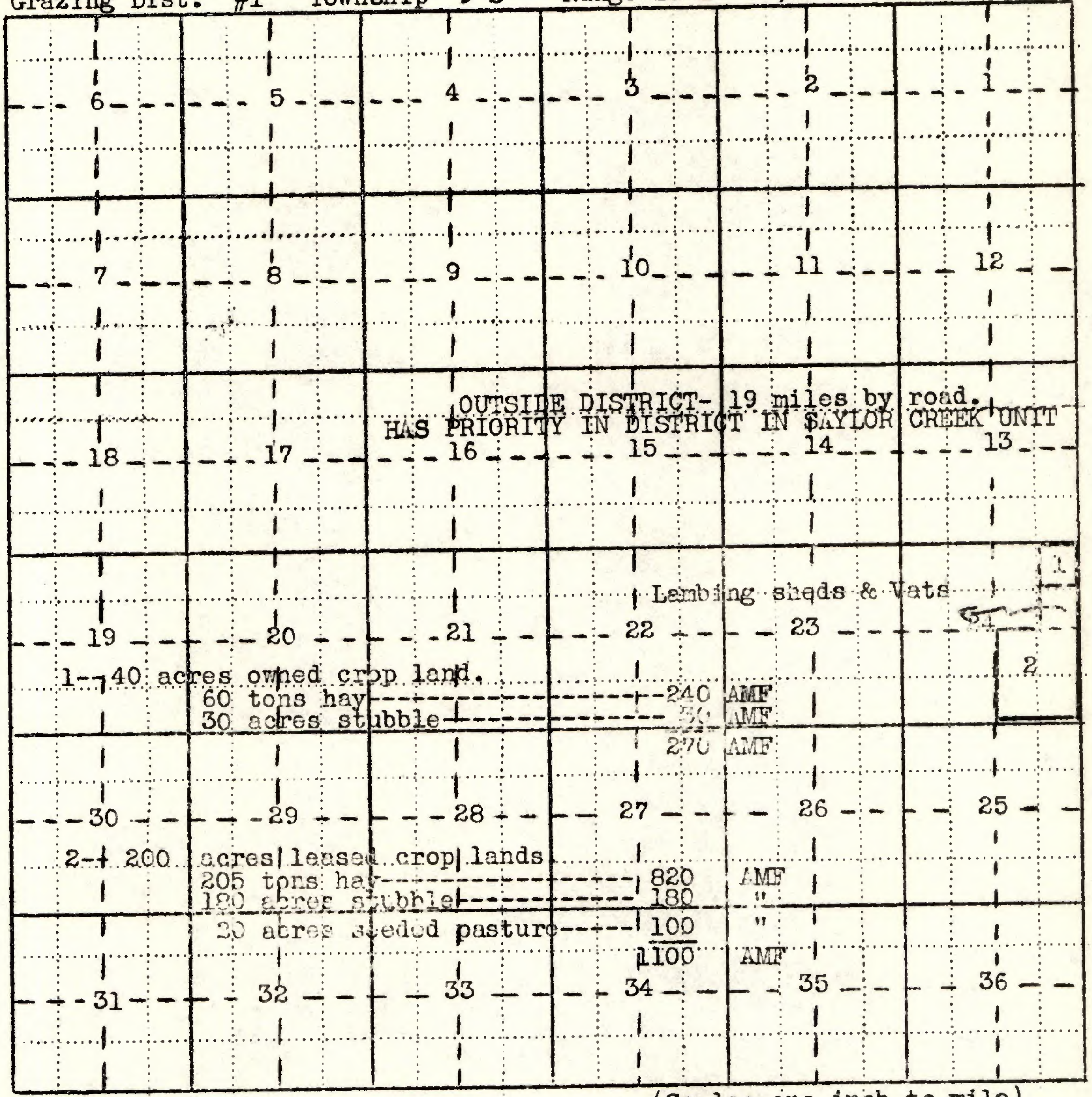
*(Also carries priority in Saylor Creek for 476 sheep
by reason of former lessees having priority in that Unit)

John Doe PLAT #1 Serial 048717

Form DG C-1

Applicant, John Doe Address, Buhl, Idaho.

Grazing Dist. #1 Township 9 S Range 15 E , Boise Meridian.



(Scale; one inch to mile)

Legend: Improved farm land colored brown.
Owned lands enclosed in red.
Leased lands enclosed in green.
Water in blue.
Water control area enclosed in yellow.

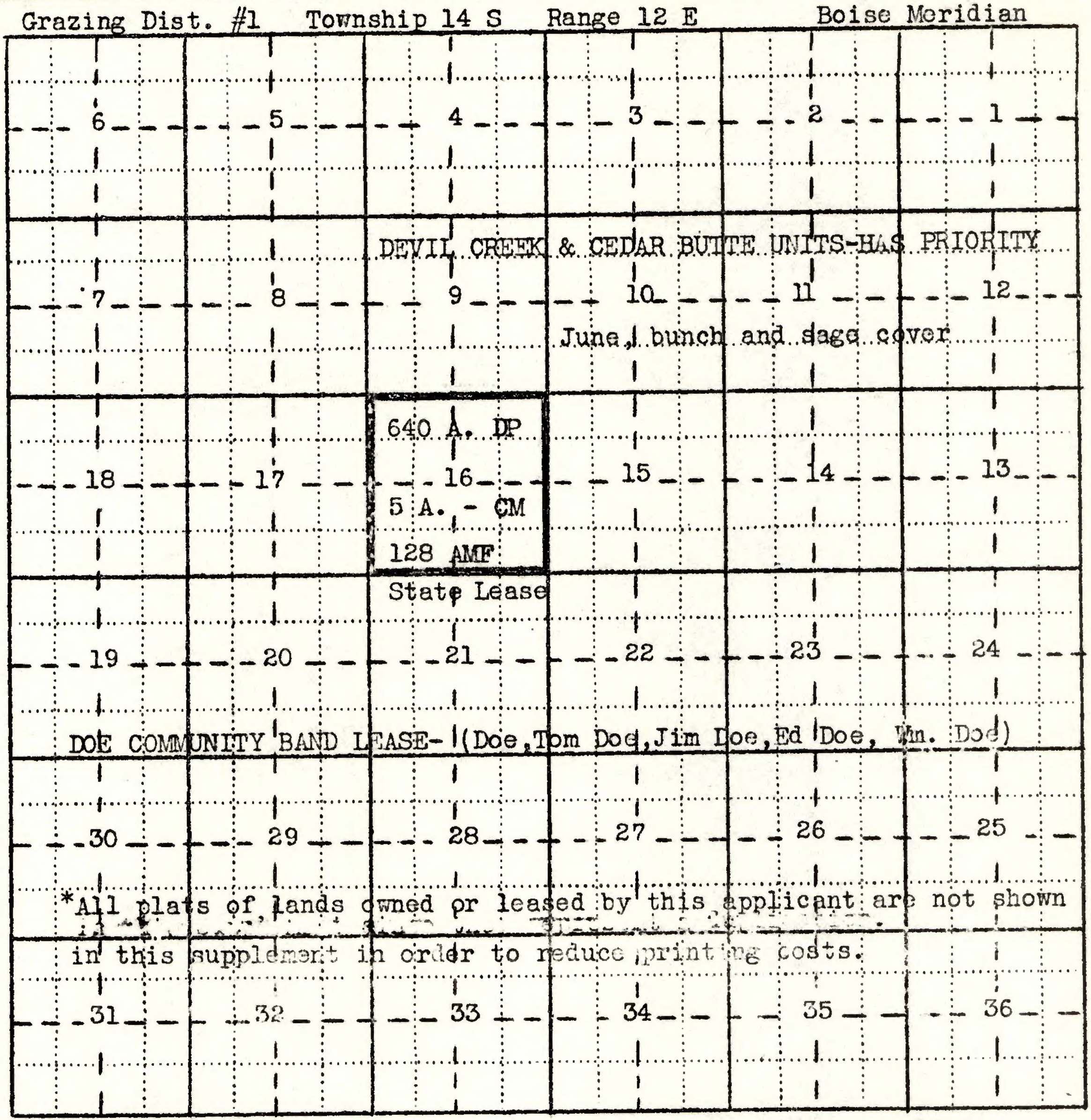
WATER:
Spring
Reservoir
Well
Streams;
Continuous
Intermittent

Remarks: (Ownership of land and water, etc.)

Form DG C-1 PLAT #3 Serial 048717

Applicant, John Doe Address, Buhl, Idaho

Grazing Dist. #1 Township 14 S Range 12 E Boise Meridian


6
5
4
3
2
1
DEVIL CREEK & CEDAR BUTTE UNITS-HAS PRIORITY
7
8
9
10
11
12
June, bunch and sage cover
640 A. DP
18
17
16
15
14
13
5 A. - CM
128 AMF
State Lease
19
20
21
22
23
24
DOE COMMUNITY BAND LEASE- (Doe, Tom Doe, Jim Doe, Ed Doe, Wm. Doe)
30
29
28
27
26
25
31
32
33
34
35
36

*All plats of lands owned or leased by this applicant are not shown in this supplement in order to reduce printing costs.

(Scale; one inch to mile)

Legend: Improved farm land colored brown.
Owned lands enclosed in red.
Leased lands enclosed in green.
Water in blue.
Water control area enclosed in yellow.

WATER:
○～ Spring
⊔ Reservoir
□ Well
Streams;
～～ Continuous
- - - Intermittent

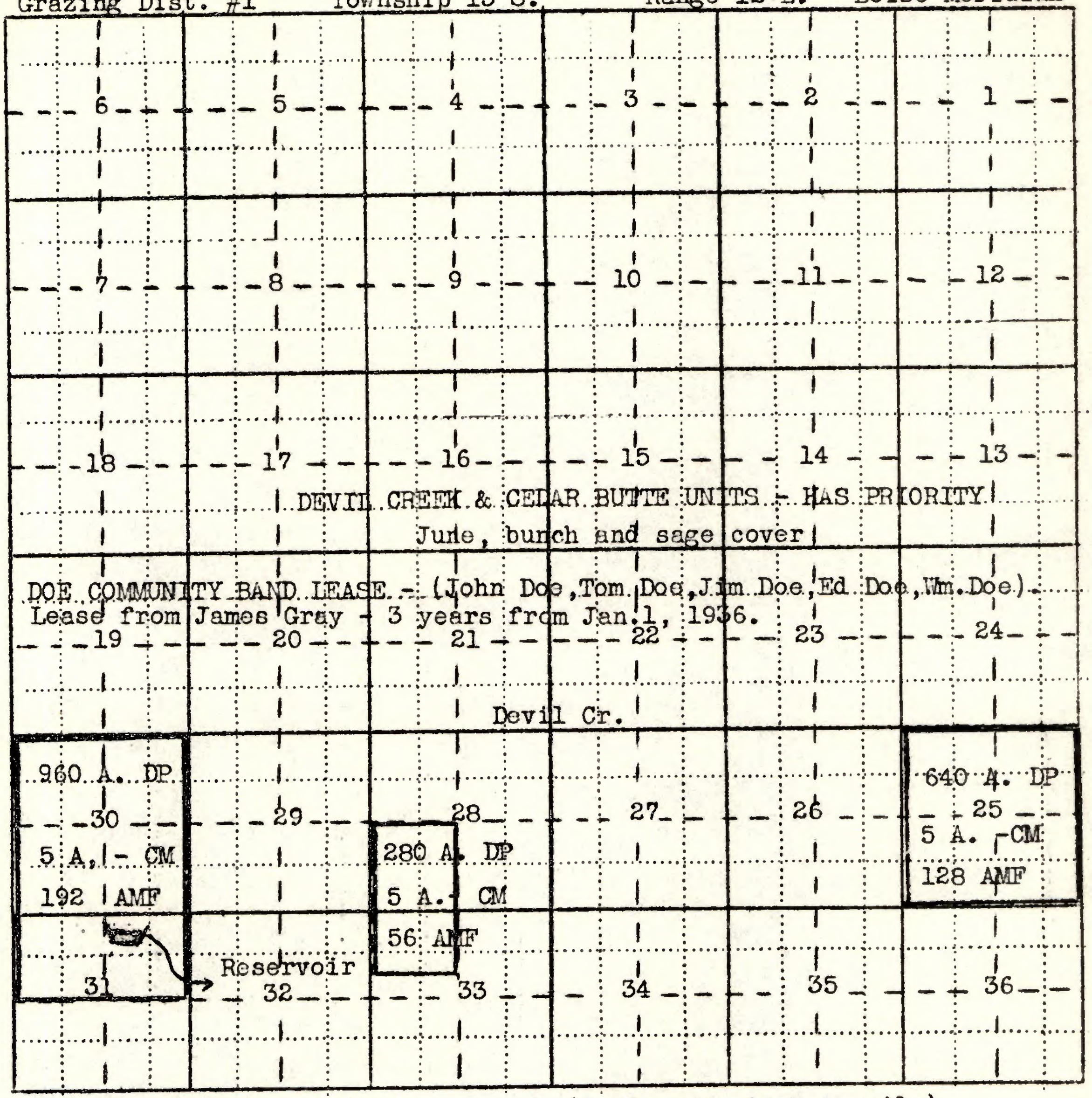
Remarks: (Ownership of land and water, etc.)
Priority: Give actual numbers if available.
Priority - 1929 - James Sheep Co. - for sheep.
1930 to 1935 inc. - Geo. Williams - for sheep.
1936 to 1941 - Doe Community Band Lease - for sheep.

Numbers each year - full carrying capacity.

Form DG C-1 PLAT #5 Serial 048717

Applicant, John Doe Address, Buhl, Idaho

Grazing Dist. #1 Township 13 S. Range 12 E. Boise Meridian


6
5
4
3
2
1
7
8
9
10
11
12
18
17
16
15
14
13
DEVIL CREEK & CEDAR BUTTE UNITS - HAS PRIORITY
June, bunch and sage cover
DOE COMMUNITY BAND LEASE - (John Doe, Tom Doe, Jim Doe, Ed Doe, Wm. Doe).
Lease from James Gray - 3 years from Jan. 1, 1936.
19
20
21
22
23
24
Devil Cr.
960 A. DP
30
5 A. - CM
192 AMF
29
28
280 A. DP
5 A. - CM
56 AMF
27
26
640 A. DP
25
5 A. - CM
128 AMF
31
Reservoir
32
33
34
35
36

Total - 1880 acres DP - 376 AMF (Scale; one inch to mile)

Legend: Improved farm land colored brown.
Owned lands enclosed in red.
Leased lands enclosed in green.
Water in blue.
Water control area enclosed in yellow.

WATER:
●~ Spring
Reservoir
□ Well
Streams;
—— Continuous
- - - Intermittent

Remarks: (Ownership of land and water, etc).

Priority - (Give actual numbers if available)

1927 - Harry King - sheep. 1928 - Otis Stock Co. - sheep & cattle.

1929-1930-1935 -John Maddox - cattle. 1931-2-3- Knight Bros. - sheep.

1934 - Hazel - sheep. 1936 - Doe et al - sheep.

Numbers each year - full carrying capacity.

Doe

048717

2
DG-Surveys

District 1
State Idaho

COMMENSURATE PROPERTY RECORD

Name JOHN DOE

Examiner (s) James V. Smith

Address Filer, Idaho, D. #1

Date 5/29/36

I FORAGE CROP LAND USE

KIND OF CROP	OWNED LAND		LEASED LAND		FORAGE DISPOSITION			ANIM.MONTHS	
	Acres	Yield (Tons)	Acres	Yield (Tons)	Tons Fed Range L.S.	Tons Fed Other L.S.	Tons Sold	Actual	Estimate
Hay	12	60	53	265	200	65	60	1300	1060
Beans	18	11	80	80	0	0	91	0	0
Grain	-	-	47	47	0	0	47	0	0
Waste Land	10	-	-						
							Totals --		1060 CM

or (5300 SM)

II PASTURE AND RANGE LAND USE

KIND or TYPE	OWNED				LEASED				AN. MO.	
	Acres Prot.	Acres Unprot.	Months Grazed	No. & Kind Livestock	Acres Prot.	Acres Unprot	Months Grazed	No.&Kind Livestock	Actual	Estimate
Hay Stubble	12	-	) *	*	53		) *see	*	65	65
Bean Stubble	18	-	)*Grazed by farm stock - 12 C		80		) other column		98	98
Grain Stubble	-	-	) 10 H, 70 S for 8½ months all		47		)		47	47
Seeded irrigated past.	-	-	) told		20		)		100	100
High Mt.Past	(Doe	share)			424	)	1½	530 S.		
** Dry Pasture	(Doe	share)				1367)	4	180 S	303	414

** 169.6 acres DP of this 1367 acres has no priority.

Totals-- 724 CM
or 3620 SM

III OTHER LAND USE DATA

Area unused for grazing (farmstead, non-forage crops, etc. 10 acres.

Area leased or rented to others: ________ acres. Type of land ________ Yrs. ______

Supplemental Remarks:

10 acres waste land on owned farm

IV RECORD OF LAND LOCATION AND CONTROL

Minor Subdivision	Sec.	Twp.	Range	Mer.	Number Acres	Owned, Leased or Homestead Entry	Priority History	Assessment Values *	
								Total	Per Acre
DOE COMMUNITY BAND LEASES - (Doe, Thomas Doe, Jim Doe, Ed Doe & Wm. Doe)									
All	16	14S	12 E	B	640	Leased	1929		
All	36	13S	11 E	B	640	Leased	none		
All	25	13S	12 E	B	640	Leased	1927		
SW¼	28	13S	12 E	B	160	Leased	1927		
Fraction NW¼	33	13S	12 E	B	120	Leased	1927		
All	30	13S	12 E	B	640	Leased	1927		
N½	31	13S	12 E	B	320	Leased	1927		
S½	10	14S	12 E	B	320	Leased	1930		
N½,SW¼,W½SE¼	11	14S	12 E	B	560	Leased	1930		
N½	12	14S	12 E	B	320	Leased	1930		
NW¼,S½NE¼, N½S½	14	14S	12 E	B	400	Leased	1930		
N½, N½SE¼	15	14S	12 E	B	400	Leased	1930		
All	30	16S	12 E	B	640	Leased	1930		
N½N½	31	16S	12 E	B	160	Leased	1930		
E½SW¼,W½SE¼	24	16S	11 E	B	160	Leased	1930		
All	25	16S	11 E	B	640	Leased	1930		

Total ---- 6760

Doe interest is 5.3/20ths or 1791 acres

* To be obtained in winter

V LEASE RECORD

Owners Name	No. Acres	Period of duration of Lease (give dates)	Sec.	Twp.	Range
State of Idaho	1280	5 yrs. from 4/23/36	16 36	14S 13S	12 E 11 E
James Gray	1880	3 yrs. from 1/1/36	25&c	13S	12 E
James Gray	2000	1 yr. from 1/1/36	10&c	14S	12 E
Wm. Brown	800	1 yr. from 5/4/36	30&c	16S	12 E
John Green	160	1 yr. from 11/18/35	24	16S	11 E
Wm. White	640	1 yr. from 11/18/35	25	16S	11 E
	6760				

IV RECORD OF LAND LOCATION AND CONTROL

Minor Subdivision	Sec.	Twp.	Range	Mer.	Number Acres	Owned, Leased or Homestead Entry	Priority History	Assessment Values *	
								Total	Per Acre
NE¼NE¼	24	9 S	15 E	B	40	Owned	1927		
SE¼, SE¼NE¼	24	9 S	15 E	B	200	Leased	1923		
SE¼NE¼ *	9	9 S	14 E	B	40	1/3 owned	None		
NW¼NW¼ *	10	"	"	"	40	" "	"		
*This 80 acres - cash basis									
								*To be obtained in winter	
See next sheet for Community Band Leases									

V LEASE RECORD

Owners Name	No. Acres	Period of duration of Lease (give dates)	Sec.	Twp.	Range
Jones & Smith	200	year to year since 1923	24	9 S	15 E

VI LIVESTOCK OPERATION

(a) Normal Year Round Operation

LAND CONTROL	PERIOD OF USE		NO.MO.	NO. LIVESTOCK, KIND	ANIMAL MONTHS	
	From	To			Actual	Estimated
Public Domain	3/15 11/1	5/15 12/1	2 1	530 S. 530 S.	212 106	212 106
Nat'l Forests or Reserves	6/15	10/15	4	350 S.		280
Leased Lands (Priv.)	(5/15	6/15	1	530 S.		106
" " (State)	(6/15	10/15	4	180 S.		144
	(10/15	11/1	½	530		53
Private Lands: *Pasturage	3/15	12/1	8½	70 S. 12 C. 10 H.		306
Feeding	12/1	3/15	3½	600 S. 12 C. 10 H.		497

* Meadow and stubble

Total - - - 1704 CM or 8520 SM

(b) Supplemental Feeds (Normal)

KIND	AMT. PURCHASED	AMT. FED	NO. & KIND LIVESTOCK	WHERE FED	ANIMAL MONTHS (Average)
None					

(c) Dependency of Operation Base to Public Domain.
Priority date in District #1 is June 28, 1931

LIVESTOCK CLASS	PRESENT NUMBERS		PRIOR USE HISTORY				
	Total Owned	1935 License	1934	1933	1932	1931	1930
* Sheep	600 S 12 C 10H	400 S	400	200	200	0	120
** Sheep (See priority sheet attached)			476	476	476	476	476
Number of Months Used 3 to 4							

*Owned & leased farm land - priority in Saylor Creek Unit. **Leased range lands.

(d) Area description of (available / customary) Public Domain; Trail distance from base 19 mis.

Saylor, Devil, Cedar Butte and Three Creek tentative Units

(e) Other Joint Users of Available Public Domain

NAME	NO.& KIND LIVESTOCK	SEASON-Mo.	PRIOR USE YRS.	TRAIL DISTANCE TO BASE
See list of	licensees in above	Units		

VII RANGE FACILITIES (Waters, Fences, Corrals, Shearing Plants, Dip Vats, etc)

Map Index	Kind & Description Also Local names	Location				Control Status	Season Avail. Months	Flow or Storage No. or Milage	Livestock Serviced	Area Serviced (Acres)	VALUATION			Dependency Rating
		Fract.	Sec.	Twp.	Rge.						Year Const.	Replace Cost	Pres. Cond.	
1.	Lambing Sheds and vats		24	9 S	15E				600 S		1929	600	OK	
5	Dirt Reservoir		31	13S	12E		Spring		2000 S	1280	-	50	OK	
6	Dirt Reservoir		11	14S	12E		Spring		2000 S	2000	-	50	OK	
6	Devil Creek	Crosses portion of	15	14S	12E		6	¼ mile -	2000 S	2560	-	-	-	
7	Spring		24	16S	11E		year	? gals. good	5000 S	3200	-	-	-	

PRIORITY SHEET - 4 (c)

LIVESTOCK CLASS	PRIOR USE HISTORY * *				LEASES
	1934	1933	1932	1931	
Sheep	160	160	160	160	State. Plat #3 - 128 AMF
Sheep	470	470	470	470	James Gray Lease- Plat #5 - 376 AMF
Sheep	500	500	500	500	James Gray Lease- Plat #6 - 400 AMF
Sheep	334	334	334	334	Wm. Brown Lease - Plat #7 - 267 AMF
Sheep	66	66	66	66	John Green Lease-Plat #8 - 53 AMF
Sheep	267	267	267	267	Wm. White Lease -Plat #8 -213 AMF
Total - - - - -	1797	1797	1797	1797	

THIS IS DOE COMMUNITY BAND LEASES, (Doe, Thomas Doe, Jim Doe, Ed Doe and Wm. Doe) and each member's interest is rated on the number of livestock grazed.

John Doe has -	530	sheep in band
Thomas Doe	400	
Jim Doe	600	
Ed Doe	100	
Wm. Doe	360	
Total -	1990	sheep in band (called 2000)

This gives John Doe a priority of 5.3/20ths of 1797 sheep or 476 sheep, from these leased lands, in Devil, Cedar Butte, and Three Creek Units (and also in Saylor Creek Unit by reason of former leases having priority in Saylor Creek Unit)

- - - - - - - - - - - -

** Priority numbers rated on basis of carrying capacity for 4 months, in accordance with Advisory Board Resolution (known as 4-months qualification) which provides for 4 months set-up of dependent commensurate property with priority.

SUPPLEMENT #2.

UNITED STATES
DEPARTMENT OF THE INTERIOR
DIVISION OF GRAZING

Form 10-a

G
Surveys
Dependent Property

GENERAL INSTRUCTIONS FOR DEPENDENT PROPERTY SURVEY

It is the intention to conduct a survey or inspection inventory of the property holdings of all applicants for grazing privileges on public domain lands. The standard of work done, whether survey or inspection, will necessarily vary with the time allotted for completion of the work. At present, for the two grazing Regions in Utah and the Colorado Region, the standard of work will consist of a field inspection of the properties controlled by the applicant done to a sufficient standard to satisfy the examiner that the applicant's statements regarding his holdings are reasonably correct.

A revised form of dependent property record titled "DG-Surveys" will be used in future work, replacing the formerly used form "DG-C" with the exception of the map sheets or plats which will continue to be used. Supplies of these forms will be available on requisition through the ECW organization and field range examiners will draw their supplies on their own requisitions.

Suggestions for Conducting the Work

In interviewing applicants to secure these records, which will be a combined interview and inspection, realize that few stockmen keep exact records as to tonnage of crop yield, the exact time of grazing different types of lands, or land under different ownership, or the exact numbers of livestock grazing or being fed at various seasons. However, you should endeavor to get the best average figures both from your investigation of the operation and from what the owner can tell you about it so that specific figures to use in computations are available. In planning your work list the applicants by locations for convenience in making interviews and for saving in travel time.

Include with the data on owned lands all valid pending homestead entries in all cases, that is, those which have been allowed. Make plain to the applicant in the case of either leased or owned lands that verbal leases or lands not of record in ownership or entry cannot be given consideration in commensurate ratings.

Explanation of the Forms

In using the columns for reporting animal months show under the column headed "Actual" the animal months usage as reported for present use. In the "Estimate" column show the computed values arrived at by use of the established yardstick ratings for the district, or the ratings which in your judgment should be given for the piece of land being inspected. Examine all areas and classify them under the appropriate headings, so as to account for the total acreage of land controlled by the applicant.

I FORAGE CROP LAND USE

List separately for each kind of forage crop and grain produced the acreage producing that crop, and the yield of that crop converted to tons. The following crop classifications are suggested: Alfalfa, native grass hay, clover, timothy, sweet clover, grain hay (Specify kind) corn fodder, corn stover, Sudan grass, millet, milo maize, cane, ensilage, sugar beets, and other root crops (pulp or tops), beans, peas, wheat, corn, barley, oats, rye, etc. Show separately the production on owned and leased lands, but under "Forage Disposition" portion of the table consolidate the tonnage of production on both owned and leased lands, using the totals only under each subheading. Show separately the tonnage fed to livestock ranging on public domain lands, that fed to livestock not ranged on public lands (milk stock, work animals, or used by human consumption) and tonnage sold.

In computing the estimated animal months for forage crops use only the tonnage fed to range livestock divided by the established yardstick ratings for that type of crop.

II PASTURE AND RANGE LAND USE

Show separately for each type of range or pasture land the protected and unprotected acreages as divided between owned and leased control. In this connection the term "protected" does not necessarily mean fenced, but means that the area is sufficiently enclosed by a fence or natural barrier so that the individual operator can exercise exclusive individual control of the time and numbers of livestock grazed. Lands which are patrolled for only part of the year should not be considered protected.

The following classifications of grazing lands will probably come up for consideration: Irrigated seeded pasture, natural meadow, hay stubble, grain stubble, dry native range, summer, dry native range, spring and fall, dry native range, winter. (If possible show the vegetative cover types such as sagebrush, greasewood, juniper, etc., for each class of grazing land).

Under the animal months column for actual use show the use as reported by the operator; under "estimated" give the rating of the individual piece of land according to your best judgment.

III OTHER LAND USE DATA

Report the total acreage under "Area Unused for Grazing" included in farmstead, orchards, nonforage crops or totally inaccessible land.

In reporting the area leased or rented to others show the total acreage, the character or type of land, and the number of years this has been leased or rented. In addition note to whom land has been leased or rented.

The space under "Supplemental Remarks" is intended for use in reporting any special conditions pertinent to land controlled or used.

IV RECORD OF LAND LOCATION AND CONTROL

Use a separate line of this tabulation for each single section or fractional part; reporting the number of acres in the lot and whether control is exercised by ownership, lease, or homestead entry.

The column "Priority History" is intended to tie in the prior use of

each section of land with grazing use of public domain and probably can best be reported by entering date of its first use in connection with the livestock operation.

The two columns under "Assessment Values" can be used in the field if the landowner can or will give the information. However, the columns are intended to be used for recording information when checks are made with the County Assessor's records.

V LEASE RECORD

Show for each piece of land under Tablo 4 where control is shown as leased, the information for each individual lease or areas containing one section or less. For leases of more than one section of land list each section or portion of a section separately in order to provide space for the proper land description. If the operator has no physical evidence of a lease, leave him a copy of Form L-1 "Statement of Land Leased", to be sent to you later, again calling his attention to the fact that unless leases are of record we cannot give them consideration.

VI LIVESTOCK OPERATION

Table A is a summary of the year-round use of lands under various forms of control by the operator. If practical to do so, five-year averages should be used here rather than a single year's operation basis. Show the disposition throughout the year of total numbers of livestock operated.

Table B reports the amount of supplemental feeds used, using a five-year average if practical. Under "Where Fed" report whether feeding is practiced on public domain or other controlled lands.

Table C - Report in numbers of livestock the total operated from the operation base on public domain, except for the column "Present Numbers - Total Owned," in which the entire number of each class of livestock should be reported as of January 1, 1936. Show on last line the number of months the public domain was used each year.

Table D - Under "Trail Distance from Base" in miles, report the distance between the operation base and the area of public domain nearest available to accommodate the size of operation being recorded. Show the distance in stock movement mileage, rather than airline distance. Include in the area description a definite reference to the township and range involved. Where available, and customary public domain areas do not coincide, describe the available public domain area which will accommodate the size of the outfit and describe the customary public domain area by a separate statement on the back of preceding sheet. In case of two definite operation bases consider each separately.

Table E is intended to show what use is obtained by other parties in the general area of public domain reported as available to the operation base of the applicant being reported.

VII RANGE FACILITIES

This table is to record information on all constructed range improvements (including livestock waters) owned or legally controlled by the livestock operator which contribute directly to his operation on public domain. List each improvement or facility separately.

1. Map Index - Number corresponding to numbered location on field map or plat. (For future use).

2. Kind & Description, also local names - Show thus:

   Drilled Well - 360' with windmill
   Developed spring, Antelope Springs
   Drift fence, log and block, Shanty Hill
   Reservoir, dirt embankment , Hell's Hole

3. Location - Give location by land description to nearest 160-acre tract, if possible.

4. Control Status - Show whether control is had by land ownership, filing, decree, lease, etc.

5. Season Available - Show months at which facility can be used or water is available.

6. Flow or Storage - Indicate flow or capacity of storage in case of waters, in case of fences, corrals, etc., show number or miles.

7. Livestock Serviced - Show number of livestock which can be accommodated by the facility exclusively.

8. Area Serviced (Acres) - Show approximate acreage of territory which the facility will accommodate exclusively.

9. Valuation - Show the year the facility was constructed or improved to highest standard. Under replacement cost give best estimate obtainable. Under present condition report simply as unusable, fair, good, exeellent.

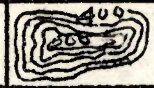
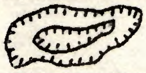
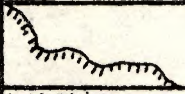
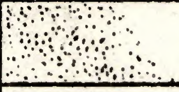
10. Dependency Rating - Show here the percent of public domain in area serviced by a watering in order to establish dependency of watering upon public domain for value.

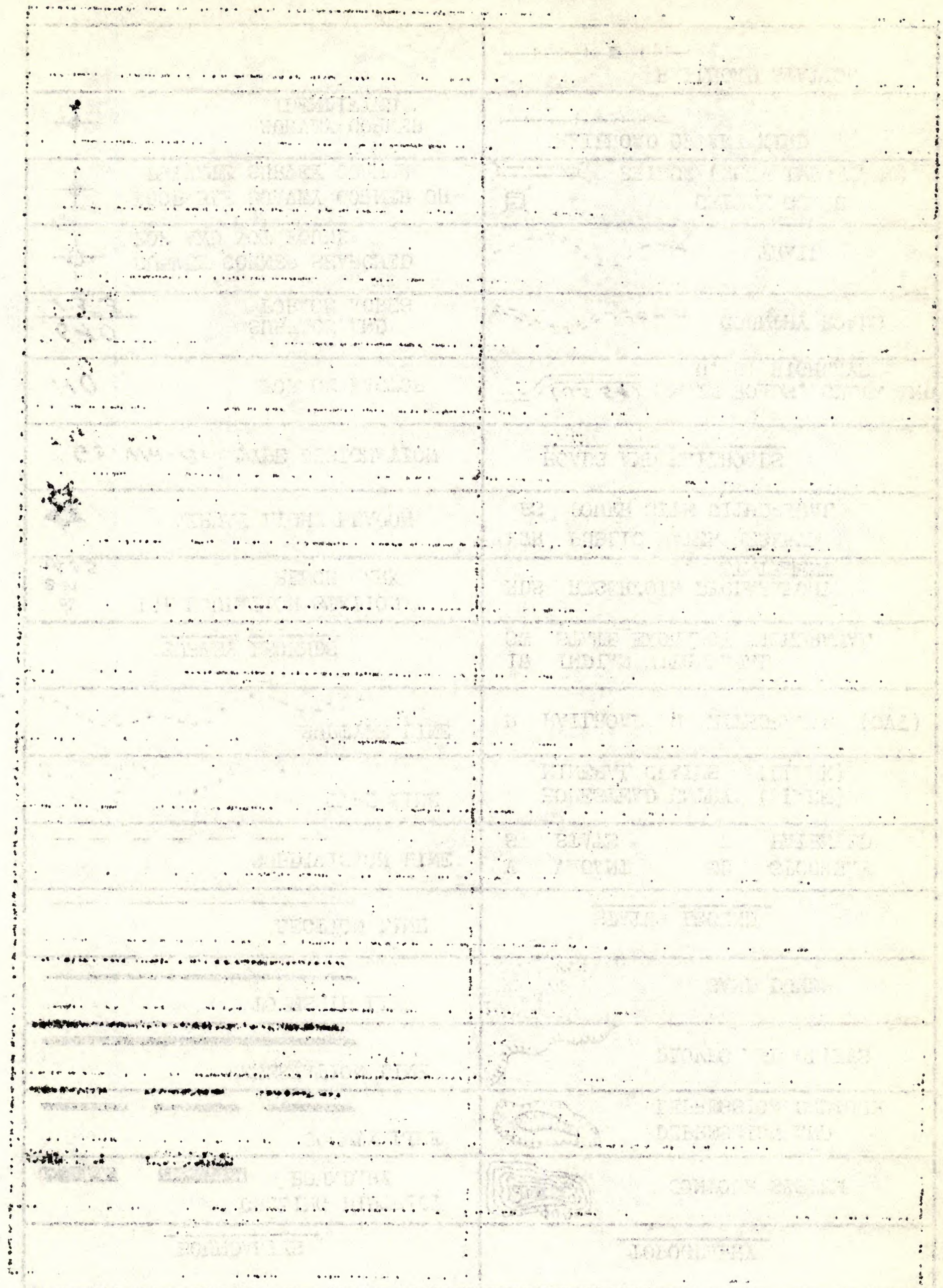
AUPPLEMENT #3.

DIVISION OF GRAZING

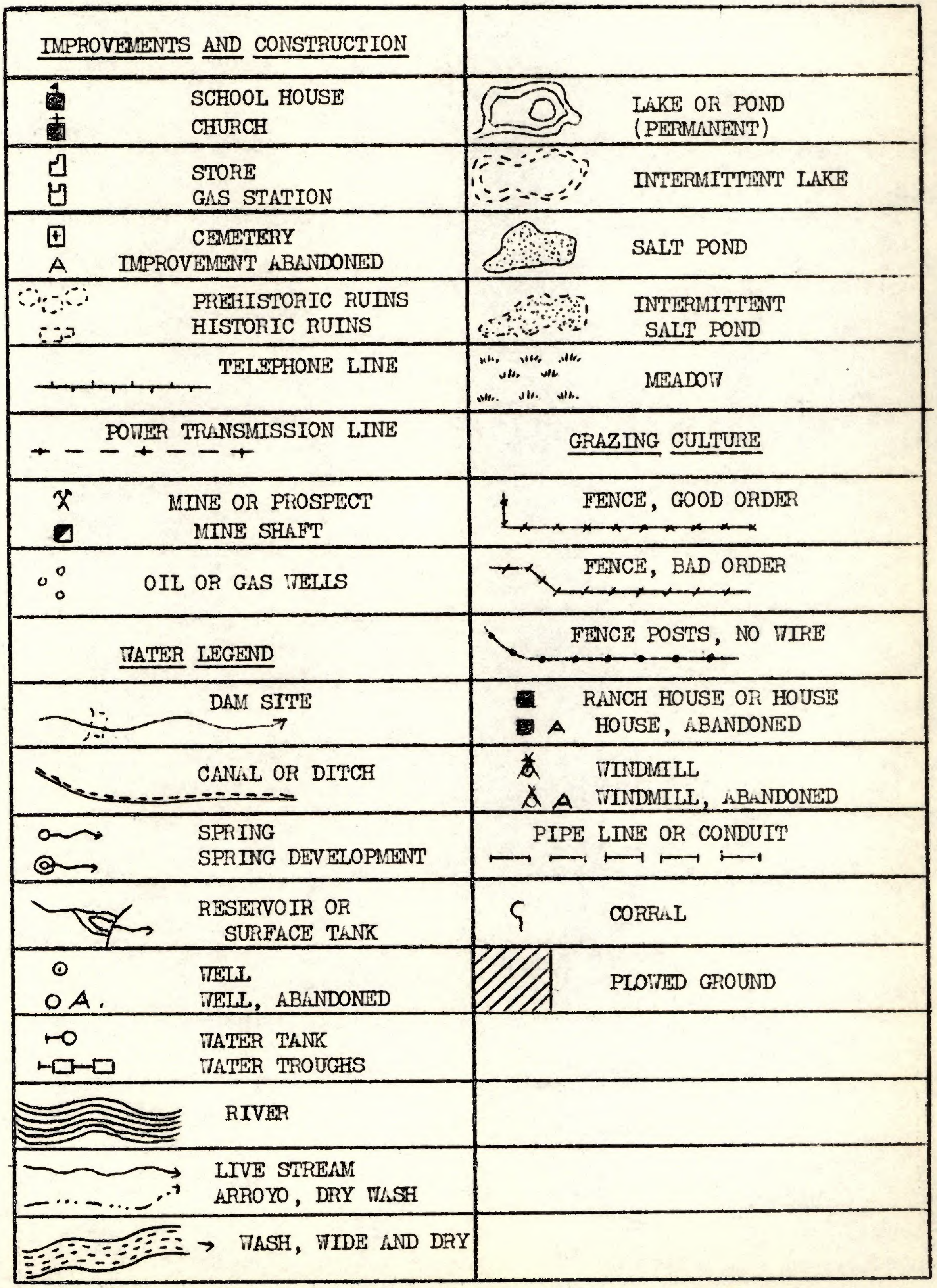
STANDARD SYMBOLS FOR STATUS AND SURVEY MAPS

APPROVED SUBJECT TO
ADDITION:________________

BOUNDARIES	TOPOGRAPHY
▬▬ ▬▬ GRAZING DISTRICT BOUNDARY	 CONTOUR SYSTEM
━━ ━━ ━━ COUNTY LINE	 DEPRESSION AND DEPRESSION CONTOUR
━━━━━━ RESERVATION LINE	 BLUFFS AND CLIFFS
────── TOWNSHIP LINE	 SAND DUNES
______ SECTION LINE	**STATUS LEGEND**
— — — — — — — SUBDIVISION LINE	V VACANT S STATE SD STOCKWAY P PATENTED
········· TYPE LINE	HOMESTEAD ENTRY (BLANK) MINERAL CLAIMS (BLANK)
- - - - - - SUBTYPE LINE	R RAILROAD W WITHDRAWAL (GVT)
SURVEY LEGENDS	IW INDIAN WITHDRAWAL SW STATE EXCHANGE WITHDRAWAL
△ TRIANGULATION STATION B.M ×1435 BENCH MARK	RDS RESERVOIR DECLARATORY STATEMENT
★ AIRWAY LIGHT BEACON	PWR PUBLIC WATER RESERVE PS POWER SITE WITHDRAWAL
7 Gs.Wd-Br TYPE DESIGNATION	**ROADS AND RAILROADS**
.10 FORAGE FACTOR	═(US 54)═ MAIN ROADS, STATE AND U. S. HIGHWAYS
$\frac{640}{153}$ SURFACE AND FORAGE ACRES	┅┅┅ COUNTRY ROADS
⌖ SURVEY CORNER SEARCHED FOR AND NOT FOUND	- - - - - TRAIL
⌖ PROBABLE SURVEY CORNER OR PRIVATE SURVEY CORNER	⌸ CATTLE GUARD ═══ BRIDGE (WHEN IMPORTANT)
✦ SURVEY CORNER IDENTIFIED	┼┼┼┼┼ RAILROAD OF ANY KIND
	┼┼┼■┼┼ RAILROAD STATION



SUPPLEMENT #3 (Continued).



IMPROVEMENTS AND CONSTRUCTION	
SCHOOL HOUSE CHURCH	LAKE OR POND (PERMANENT)
STORE GAS STATION	INTERMITTENT LAKE
CEMETERY IMPROVEMENT ABANDONED	SALT POND
PREHISTORIC RUINS HISTORIC RUINS	INTERMITTENT SALT POND
TELEPHONE LINE	MEADOW
POWER TRANSMISSION LINE	**GRAZING CULTURE**
MINE OR PROSPECT MINE SHAFT	FENCE, GOOD ORDER
OIL OR GAS WELLS	FENCE, BAD ORDER
WATER LEGEND	FENCE POSTS, NO WIRE
DAM SITE	RANCH HOUSE OR HOUSE HOUSE, ABANDONED
CANAL OR DITCH	WINDMILL WINDMILL, ABANDONED
SPRING SPRING DEVELOPMENT	PIPE LINE OR CONDUIT
RESERVOIR OR SURFACE TANK	CORRAL
WELL WELL, ABANDONED	PLOWED GROUND
WATER TANK WATER TROUGHS	
RIVER	
LIVE STREAM ARROYO, DRY WASH	
WASH, WIDE AND DRY	

SUPPLEMENT #4

DIVISION OF GRAZING

LEGEND FOR STATUS MAPS

(Peerless transparent water colors
based on one ounce of water.)

V	Vacant Land	Geranium Pink	20 drops
S	State Land	Sky blue	15 drops
SD	Stock Driveway	Sepia	20 drops
P	Patented	Black outline	
	Homestead Entry	Black "	
	Mineral Claims	Black "	
R	Railroad Land	Cadmium Orange	25 drops
	National Forest	Light Green	20 drops
	National Parks	Royal Purple	10 drops
	Indian Reservations	Brilliant Yellow	15 drops
IW	Indian Withdrawal	Black outline	
RW	Reclamation Withdrawal	" "	
SW	State Exchange Withdrawal	" "	
W	Withdrawal (Government)	" "	
PWR	Public Water Reserve	" "	
PS	Power Site Withdrawal	" "	
RDS	Reservoir Declaratory Statement	Black outline	
H	Withdrawn for Exchange (with initial of last name of applicant for exchange).	Black outline	

1-340

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF THE SECRETARY
DIVISION OF GRAZING

SUPPLEMENT #5.

Examiner .... Date .... 19 ....
Sec. .... T. .... R. ....
Type ....
Range vegetation ....
(Density) (% Palatability)
F. A. Factor .... For ....
Timber .... Composition .... Condition ....

PRINCIPAL SPECIES

Forbs %	Amt. In %	Amt. X Pal.	Grasses % Grasslike Plants %	Amt. In %	Amt. X Pal.	Shrubs %	Amt. In %	Amt. X Pal.

TYPE COMMENT

Poisonous plants .... (Species and location)
.... (Abundance) .... (Losses)
Watering places .... (Nearest available) (Lake, spring, tank)
(Temporary or permanent) (If temporary, state usable period)
Proper grazing season .... (Reasons)
.... (Class of stock best suited to range)
Utilization .... (In former year) (Present year in %)
.... (Reasons for unsatisfactory conditions)
Recommendations and conclusions .... (Bed or salt grounds)
.... (Adjustments needed)
.... (Range improvements needed)
.... (Other remarks)

TABLE I

Date..................

SUMMARY OF GRAZING SURVEYS
BY
ALLOTMENTS
OR
GRAZING DISTRICTS

TABLE I or II

_____________ DISTRICT

ALLOTMENT OR GRAZING DISTRICT	TOTAL GROSS AREA	TOTAL ALIENATED LANDS NOT SUBJECT TO G.S. CONTROL	TOTAL ALIENATED LANDS SUBJECT TO LISTING AS DEPENDENT PROPERTY		TOTAL NET DISTRICT AREA		AREA OF WASTE RANGE	AREA FROM WHICH STOCK ARE EXCLUDED		AREA OF STOCK DRIVEWAYS		USEABLE NET DISTRICT AREA					AVERAGE FORAGE FACTOR OF USEABLE AREA
													Gs-Wd	Br	Annual	TOTAL	
	SA	SA	SA	FA	SA	FA	SA	SA	FA	SA	FA	SA	FA	FA	FA	FA	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

.... DISTRICT

TOWNSHIP SUMMARY OF GRAZING TYPES

T. R. MERIDIAN GRAZING SURVEY PROJECT ...., 19 ....

Section	Total Acres	Alienated			District Land Range Stock Excluded		Density .... Type .... Gs-Wd ... % Br ... %			Density .... Type .... Gs-Wd ... % Br ... %			Density .... Type .... Gs-Wd ... % Br ... %			Density .... Type .... Gs-Wd ... % Br ... %			Density .... Type .... Gs-Wd ... % Br ... %			Density .... Type .... Gs-Wd ... % Br ... %			Density .... Type .... Gs-Wd ... % Br ... %			Density .... Type .... Gs-Wd ... % Br ... %			Density .... Type .... Gs-Wd ... % Br ... %			Density .... Type .... Gs-Wd ... % Br ... %			Density .... Type .... Gs-Wd ... % Br ... %			Density .... Type .... Gs-Wd ... % Br ... %			Density .... Type .... Gs-Wd ... % Br ... %		
		Lands not subject to D.G. control	Dependent Range Used in connection with permits					Gs.	Br.		Gs.	Br.		Gs.	Br.		Gs.	Br.		Gs.	Br.		Gs.	Br.		Gs.	Br.		Gs.	Br.		Gs.	Br.		Gs.	Br.		Gs.	Br.		Gs.	Br.		Gs.	Br.
								F.F.	F.F.		F.F.	F.F.		F.F.	F.F.		F.F.	F.F.		F.F.	F.F.		F.F.	F.F.		F.F.	F.F.		F.F.	F.F.		F.F.	F.F.		F.F.	F.F.		F.F.	F.F.		F.F.	F.F.		F.F.	F.F.
			S.A.	F.A.	S.A.	F.A.	S.A.	F.A.	F.A.	S.A.	F.A.	F.A.	S.A.	F.A.	F.A.	S.A.	F.A.	F.A.	S.A.	F.A.	F.A.	S.A.	F.A.	F.A.	S.A.	F.A.	F.A.	S.A.	F.A.	F.A.	S.A.	F.A.	F.A.	S.A.	F.A.	F.A.	S.A.	F.A.	F.A.	S.A.	F.A.	F.A.	S.A.	F.A.	F.A.
1																																													
2																																													
3																																													
4																																													
5																																													
6																																													
7																																													
8																																													
9																																													
10																																													
11																																													
12																																													
13																																													
14																																													
15																																													
16																																													
17																																													
18																																													
19																																													
20																																													
21																																													
22																																													
23																																													
24																																													
25																																													
26																																													
27																																													
28																																													
29																																													
30																																													
31																																													
32																																													
33																																													
34																																													
35																																													
36																																													
Total,																																													

	Waste Range	Water	Cuts for Waste			Cuts for			Total District Range Available				Summary of Allotments																																			
	S.A.	S.A.	S.A.	Gs. F.A.	Br. F.A.	S.A.	Gs. F.A.	Br. F.A.	S.A.	Gs. F.A.	Br. F.A.	Total F.A.	S.A.	Gs. F.A.	Br. F.A.	Total F.A.	S.A.	Gs. F.A.	Br. F.A.	Total F.A.	S.A.	Gs. F.A.	Br. F.A.	Total F.A.	S.A.	Gs. F.A.	Br. F.A.	Total F.A.	S.A.	Gs. F.A.	Br. F.A.	Total F.A.																
1																																																
2																																																
3																																																
4																																																
5																																																
6																																																
7																																																
8																																																
9																																																
10																																																
11																																																
12																																																
13																																																
14																																																
15																																																
16																																																
17																																																
18																																																
19																																																
20																																																
21																																																
22																																																
23																																																
24																																																
25																																																
26																																																
27																																																
28																																																
29																																																
30																																																
31																																																
32																																																
33																																																
34																																																
35																																																
36																																																
Total,																																																

Date ______

SUMMARY OF GRAZING SURVEYS
SHOWING
PREFERENCES-STOCKING-ESTIMATED CARRYING CAPACITY
AND
ADJUSTMENTS NEEDED BY ALLOTMENTS

TABLE III

_______ DISTRICT

ALLOTMENT	TOTAL PREFERENCES AND EXEMPT REDUCED TO STOCK MONTHS	USEABLE NET DISTRICT AREA		SHARE OF RANGE BASED ON PREFERENCES			DIFFERENCE BETWEEN SHARE OF RANGE AND PRESENT ALLOTMENT				PREFERENCE STOCKING INCLUDING EXEMPT			ACTUAL STOCKING INCLUDING EXEMPT			ESTIMATED CARRING CAPACITY			ADJUSTMENTS INDICATED AS NECESSARY TO MEET ESTIMATED CARRYING CAPICITY		
							PLUS		MINUS													
		SA	TOTAL FA	%	SA	FA	SA	FA	SA	FA	NUMBER OF STOCK MONTHS	SA PER STOCK MO.	FA PER STOCK MO.	NUMBER OF STOCK MONTHS	SA PER STOCK MO.	FA PER STOCK MO.	NUMBER OF STOCK MONTHS	SA PER STOCK MO.	FA PER STOCK MO.	REDUCTION IN STOCK MONTHS	INCREASE IN STOCK MONTHS	
1.	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23

SUPPLEMENT #7

GLOSSARY OF RANGE MANAGEMENT TERMS

Actual use records: Accurate written information as to numbers of stock grazed, season grazed, condition of range, and current utilization.

Alienated land: Any land not connected with jurisdiction, (private land).

Alpine zone: That vegetational belt above timber line.

Allotment: A specific part of the range to which the stock of a permittee or group of permittees is definitely assigned.

> **Individual Allotment:** An allotment on which a single owner's stock is permitted to graze.
>
> **Community Allotment:** An allotment on which stock of a group of owners are permitted to graze.
>
> **Sub-Allotment (or Management Unit):** A portion of an allotment within which movement of livestock is naturally or artificially controlled under the general plan for obtaining proper use of the allotment as a whole.

Allotment Act, either patented or held in trust for the Indian by the Government.

Animal Month; (Carrying Capacity): An estimate of the amount of available forage necessary to support and maintain an animal for a period of 30 days.

> **Animal Month, (Actual Use):** The amount of available forage which past use has demonstrated will support and maintain an animal for a period of 30 days under average range conditions obtaining in that locality.

Animal Unit: See Carrying Capacity Unit.

Annuals: A term applied to those plants which complete their life cycle in the period of one year or less.

Artificial revegetation: The establishment of vegetation by artificial methods.

Artificial reseeding: The process of establishing vegetation by the artificial dissemination of seed.

Available forage: Those palatable plants and plant parts which are within reach of grazing livestock.

Balanced ration: A combination of feeds which contain all elements necessary for the growth and maintenance of livestock.

Band: Any number of sheep handled as a single unit.

Barrier: An obstruction which limits the movement of livestock, (cliffs etc.)

Bedding out: A system of herding sheep wherein the band is bedded on the range, usually for not more than three successive nights on a given location.

Biotic Influence: Biological influences on vegetable life as contrasted to climatic influences, etc.

Branding: The use of a hot iron, paint, or chemicals, on the skin of an animal to designate ownership.

Breeding herd: A group of livestock used for the express purpose of propagation. In the case of cattle: Cows and bulls and those heifers retained for replacement purposes. Sheep: Mature ewes, bucks and such young ewes kept for replacement purposes.

Browsing: The process of feeding on the tender shoots of trees and shrubs.

Bunch grasses: Those grasses so called because of their characteristic habit of forming bunches in contrast to the sod forming grasses. Chief among these are sacaton, drop-seed, feather grass, fescue and wheat grass.

Calf crop: The annual number of calves produced by a given breeding herd.

Carrying capacity: The number of stock that a given area will support in good condition year after year without damage to the range.

Carrying capacity unit: Forage sufficient to support and maintain one animal of a given class for the period of one year. The adult cow is usually indicated as the standard. For the purpose of expressing carrying capacity, other animals are converted to cows. For example: the amount of feed consumed by one cow may be represented as 100%; for a bull 125%; a yearling 75%, a horse 125%, a sheep 25%, etc.

Thus, 2 cows, one horse and three sheep would represent four carrying capacity units.

Chaparral: A plant community made up of various shrub species exclusive of sage, generally occurring just below timber zones and above grass or sage zones.

Charco: A depression, sometimes natural, sometimes constructed, that impounds water. Differs from a tank or reservoir in that the dam is not relied upon to back up the water.

Class of stock: Any specific kind of livestock, ie., cattle, sheep, horses or goats.

Class overgrazing: Overgrazing of certain plant species by a given class of stock due to their preference.

Class ratio: The relationship between the numbers of different classes of stock.

Climax: The major divisions of units of the vegetation - the highest expression of vegetation possible under a given climate or environment.

Common use: The use of a given range by more than one class of stock and/or livestock owner.

Competition: The stress occurring between plants due to their mutual food and water requirements.

Compilation: The act of assembling and putting together of field data.

Complete protection: The withdrawal of all livestock from a given range.

Composition: The relative amounts of available plant species which go to make up the plant cover on a given type (expressed in percent).

Condition (range): The state of being of a range as it compares to the ideal.

Composition and density of vegetation and soil condition (expressed in degree of erosion) are factors to be considered in judging condition of a range. Do not confuse with "utilization". A range may be under-utilized for a current year, yet be in poor condition and vice versa.

Consolidated band: A band made up of several small bands owned by different individuals.

Cow month: The amount of available forage necessary to support and maintain a cow for the period of thirty days.

Cut: The amount expressed in percentage which is deducted from the estimated number of forage acres on a given type to allow for various factors which reduce availability of the type, ie., steep slopes, rocks, down timber, etc. (Also is applied to the reduction of stock. Commonly used in some localities to designate a small number of sheep lost or strayed from the main band).

C. Y. L. : The abbreviation for "cattle year long" - the number of cattle which a given range will support for the period of one year.

Deferred grazing: The system of grazing wherein the forage is not pastured until it has attained a certain stage of growth - usually seed maturity.

Density: Term applied to vegetation within reach of stock indicating degree to which ground is covered or overshadowed. Expressed in tenths, ten tenths being a complete cover.

Dependent property: A term applied to owned or controlled ranch property that is dependent upon use of public or other range in a year 'round ranch set-up. Example: Hay produced that is not sold but must be disposed of through feeding to livestock is dependent upon public range to carry livestock during the season that livestock are not fed. The water development surrounded by public range would have little or no value unless that range was used to run livestock watering at the development. In other words, the development is dependent upon range privileges to give it value.

Digestion coefficient: A term used to designate the amount of a given

food-stuff that is digested by the animal.

Distribution of stock: The apportioning of stock over the range in an attempt to secure uniform use of forage throughout.

Dipping vats: A vat made of concrete, wood or iron for holding solutions in which animals are dipped for the control of scabies, ticks, etc.

Drift Fence: Any fence, used by itself or in connection with natural barriers, to retard or prevent stock from drifting from their regularly assigned range to another. A term used by early-day stockmen and now often misapplied. Where there was open range, cattle often "drifted" off of their home range because of storms, etc. Fences were constructed to prevent this. They seldom formed complete inclosures.

Driveways: A strip of country set aside for the express purpose of movement of livestock from place to place, as range to R. R. point.

Drop band: Those ewes of the band that are dropping lambs or are expected to drop their lambs in a day or two.

Drought form: The aspect which a plant attains under drought conditions.

Dry band: A band of sheep without lambs.

Dual use: The use of a given range by two classes of stock at the same time.

Economic band (sheep), herd (cattle): That number of breeding animals, the income from which will provide a family a reasonable standard of living.

Enclosures: An area within which stock are held by artificial barriers for a specific purpose.

Environment: The sum total of all physical factors which are brought to bear upon an organism, as soil, moisture, temperature.

Exclosures: An area from which livestock are excluded by artificial means.

Exempt stock: Stock which are permitted to graze on the public domain free of charge. Confined to animals actually used for domestic purposes, such as work or saddle horses, milk cows, etc.

Exposure: The direction of a slope with respect to the cardinal points.

Extensive grazing survey: A grazing survey in which no area less than fifty

acres is ordinarily typed.

Fee: The amount charged by the Grazing Service for each animal unit. Usually expressed as so much per cow month or so much per sheep month.

Forage: The term applied to plants and plant parts used as feed by livestock.

Forage acre: Range land in the amount necessary to furnish the equivalent of one acre completely (10/10) covered with vegetation which is 100% palatable. The number of forage acres in a type is obtained by multiplying the number of surface acres by the forage factor.

Forage acre factor: The figure arrived at by multiplying the average palatability of a type by the average density. (See Palatability).

Forage acre requirement: The number of forage acres necessary to support and maintain a given animal for a definite period of time.

Game refuge: An area upon which the hunting of game animals is prohibited.

Grazing: The process of feeding on plants by stock. Strictly speaking it is applied only to grasses - (See"Browsing").

Grazing period: The length of time that stock are grazed on an area.

Grazing preference: A special consideration over other grazing applicants because of ownership of dependent ranch property, prior use of the range, etc. Usually expressed in terms of a definite number of livestock.

Grazing survey: The systematic collection of data pertaining to forage resources and other information pertinent to proper range management.

Grazing unit: Any division of the range used to facilitate range administration or the handling of stock. Usually applied to a subdivision within an allotment.

Hurdle system: A term sometimes applied to the method of handling sheep by means of a wolf-proof pasture.

Indicator: A plant which shows by its presence some particular condition such as overgrazing, poor soil, etc.

Intensive grazing survey: A grazing survey of such detail that, when necessary, types as small as five acres are indicated.

Lamb crop: The number of lambs produced by a given band of breeding sheep.

Lambing ground: Range reserved for grazing during lambing period.

Local overgrazing: Overgrazing in localized areas on a range as around water.

Major plot: Any sample plot of greater size than the usual metor square quadrat, being used for observation of plant species.

Marking: Any method used to designate ownership of livestock other than branding; e.g. ear marks, dew laps, wattles, etc.

Natural increase: Any increase in numbers within a herd by propagation alone.

Natural revegetation: The rehabilitation of any area without use of artificial methods.

Nutritive ratio: The proportion existing in a livestock feed between the digestible crude protein and the combined digestible carbohydrates and fats.

Nutritive value: A term usually prefixed by "high", "low", etc. to indicate relative capacity of a given forage in furnishing nutrition for livestock.

Open herding: The method of handling sheep whereby they are allowed to scatter to a certain extent and are not bunched closely.

Optimum: The ideal condition.

Overgrazing: Over-utilization of forage carried on year after year.

Overlay: A transparent sheet used as a supplementary map containing either information of more or less changeable character, or that which is more clearly shown in this manner.

Overstocking: Stocking beyond carrying capacity.

Palatability; plant: The amount, expressed in percent, of a plant which can be and will be grazed when the range as a whole is properly utilized.

Palatability type: Obtained by multiplying percent of composition of each specie by the percent of palatability of that plant.

Permanent water: A watering place which supplies water at all times throughout the year.

Permittee: One who has the privilege of grazing a certain number of livestock on a given area by reason of having been granted a permit by the

administrators of the land in question.

Plan: A collection of all available information necessary to give a picture of the problem, together with objectives and program of recommended action, all of which are put together in usable form for the purpose of aiding administrators and users in obtaining the best possible use on a given range. It is made up of the following parts:

A. Graphic: One or more maps pertinent to the subject.

B. Tabular: A tabulation of all pertinent data.

C. Written: A written report containing such things as past, present, and future use, objectives, unusual features, description of topography and forage, and instructions as to future use with reasons, etc.

Plant cover: All plants found on a given range whether or not they are available, palatable, poisonous or otherwise.

Plant symbol: An abbreviation used on type map or otherwise to indicate a given species.

Precipitation: Any condensation and resultant falling of water vapor from the air; e.g., rain, snow, hail, fog, etc.

Predator: Any animal or bird which lives by preying on another.

Premature grazing: The grazing of forage before it has attained sufficient growth (in the spring) to insure manufacture of its own food when coupled with utilization.

Proper stocking: Stocking of range to its carrying capacity.

Proper use: The handling of the range to the best advantage, considering all factors, such as: seasonal use, numbers of stock, distribution, etc.

Proper utilization: The degree of use, which if continued year after year, will result in the maintenance of the grazing capacity of the range.

Quadrat: A rectangular, usually square, plot used in ecological and other biological studies; usually one square meter in size.

Range: Any large tract of grazing land supporting native forage.

Range administration: The conduct of the affairs of a range.

Range appraisal: The classification and valuation of range land, including all improvements thereon from the economic standpoint. Used to determine loan values, or a basis for fees.

Range control: The handling of range and livestock in such a manner as to bring about desired conditions.

Range examiner: A person who collects and compiles all information pertaining to proper range management and who also prepares grazing management plans.

Range improvements: Any artificial means employed to increase the utility and ease of management of the range; e.g. development of water, fencing, reseeding, poisonous plant eradication, etc.

Range inspection: The act of sizing up a range unit in the field, finding the flaws in the existing management, and gathering data upon which remedies may be brought about.

Range management: The regulation of grazing with the object of using the grazing resources to the fullest extent possible consistent with the protection, development and use of other resources, without injury to the grazing capacity of the range.

Range research: A systematic, critical inquiry or examination in seeking facts or principles pertinent to range problems, especially an analysis and classification of the fundamental causes and forces creating the problems. Usually accomplished by the medium of Experiment Stations.

Reconnaissance: A term applied to grazing surveys. See ultra-extensive grazing surveys.

Related resources: Those resources which bear relationship to one another because of common site and dependency, such as range, game, recreational, watershed, timber, etc.

Relative carrying capacity: The expression of the value of one range as compared to that of another. Not absolute.

Reproduction: Any young timber growth which has not attained a height sufficient to insure it against grazing damage. This is not a silvicultural definition.

Rodent control: Measures taken to reduce or eradicate the rodent population on a given area. This may apply to specific species or rodents in general, including rabbits.

Rodent damage: Any injury to resources attributed to rodents.

Rotation grazing: The grazing system whereby a given sub-division of range is alternately grazed and rested.

Salting: The distribution of salt on the range to the best advantage of the livestock and the range. Under proper use it is one method of attaining proper distribution of stock.

Salting grounds: Areas where salt is placed for the use of livestock.

Sample plot: See study plot.

Scientific name: Botanically - A Latin or Latinized name, universally used to indicate the genus and species of a given plant. *Hilaria jamesii* (Galleta grass)

Seasonal use: The holding of stock on an area during a given season of the year.

Segregation: The separation usually by fencing of classes or types of stock.

Selective grazing: A term applied to the system of grazing a range year long (without seasonal movements of stock) whereby the stocking is conservative enough to allow adequate reproduction of forage plants, by the selection of plants most palatable to the class of livestock using the area.

Sheep month: The amount of available forage necessary to support and maintain a sheep for the period of thirty days.

Sod grass: Any grass which reproduces vegetatively thereby forming a heavy sod or turf.

Stock: The term applied to all classes of domestic animals, generally applied to mammals used for food.

Stock month: Same as "animal month".

Stock reduction: The decreasing of the number of stock on a given range.

Stock water: Watering places set aside for the express use of stock.

Study plot: An area of ground set aside for the purpose of the observation of vegetation. It varies greatly in size, generally not being greater than two acres in area.

Sub type: A division of one of the major forage types made on the basis of the difference in composition or density or both.

Supplementary feed: Feeds, such as hay and ensilage or concentrates, such as cottonseed cake, corn, etc., which are fed to livestock when the range forage is of insufficient quantity or of inferior quality or when it is unavailable because of snow, etc.

Surface acre: An acre of ground. Called "surface" acre to distinguish from "forage" acre.

Sustained yield: The production of desirable forage, permanently continued without decrease in yield.

S. Y. L.: The abbreviation for "sheep year long" - the number of sheep which a given range will support for the period of one year.

Tagging: The process of attaching a metal tag to livestock to designate ownership.

Tank: (Stock) Any structure, the purpose of which is to impound water for livestock. A dirt, earthen or surface tank is formed by throwing up a dam across a natural drainage channel thereby "backing up" water. See "charco".

Temporary water: A watering place that does not furnish water year round.

Trailing: The translocation of livestock on the hoof.

Trampling: The damage to plants and soil brought about by the congested movements of livestock.

Type: An area of land having a class of vegetation which readily differentiates it from other areas, its designation being determined by the more conspicuous vegetation; e.g. grassland, timber, sagebrush, etc.

Stock month: Same as "animal month".

Stock reduction: The decreasing of the number of stock on a given range.

Stock water: Watering places set aside for the express use of stock.

Study plot: An area of ground set aside for the purpose of the observation of vegetation. It varies greatly in size, generally not being greater than two acres in area.

Sub type: A division of one of the major forage types made on the basis of the difference in composition or density or both.

Supplementary feed: Feeds, such as hay and ensilage or concentrates, such as cottonseed cake, corn, etc., which are fed to livestock when the range forage is of insufficient quantity or of inferior quality or when it is unavailable because of snow, etc.

Surface acre: An acre of ground. Called "surface" acre to distinguish from "forage" acre.

Sustained yield: The production of desirable forage, permanently continued without decrease in yield.

S. Y. L.: The abbreviation for "sheep year long" - the number of sheep which a given range will support for the period of one year.

Tagging: The process of attaching a metal tag to livestock to designate ownership.

Tank: (Stock) Any structure, the purpose of which is to impound water for livestock. A dirt, earthen or surface tank is formed by throwing up a dam across a natural drain or channel thereby "backing up" water. See "charco".

Temporary water: A watering place that does not furnish water year round.

Trailing: The translocation of livestock on the hoof.

Trampling: The damage to plants and soil brought about by the congested movements of livestock.

Type: An area of land having a class of vegetation which readily differentiates it from other areas, the designation being determined by the more conspicuous vegetation, e.g., grassland, timber, sagebrush, etc.

Type designation: The designation used to indicate a type made up of the type symbol and the principal species symbols; e.g. 1-Ga. - Sha. - Sac.

Type line: A line in type mapping used to designate the boundaries of a type.

Type map: Any map showing types and type designations. It may also contain forage factors, forage acres, surface acres, cultural features, and any other information pertinent to proper range management.

Type of stock: A classification of stock based on use and purpose.

Type symbol: The numerical designation adopted to express the forage type in a brief manner; e.g., 1 equals grassland.

Type utilization: The utilization of the plant species within a type. This data is used as a step in the determination of range utilization.

Type write-up: A scientific description of a type, including information for compilation and formulation of range management plans.

Ultra extensive grazing survey: A grazing survey of a preliminary nature. A reconnaissance.

Utilization: The extent to which range forage is grazed by livestock.

Unavailable forage: That which can not be reached by livestock.

Under stocking: Stocking of a range to less than its carrying capacity.

Under utilization: Use of the range below the point of proper utilization.

Unit description: A written enumeration of such factors as topography, water, general description of vegetation, past and present use, recommendations for improvements, special features, etc., in reference to a range unit.

Vegetative cover: Same as "plant cover".

Vegetative litter: The accumulation of plant material made up of dead plants and parts of plants.

Vegetative readiness: That stage of plant growth when the vegetation may be grazed without endangering its ability to maintain itself.

Vegetative reproduction: Production of new plants by the parent plant other than by seed.

Wet band: A band of sheep with nursing lambs.

Yearling: An animal approximately one year of age (Short yearling - 9 to 12 months. Long yearling - 12 to 18 months).

Yearlong range: Range suitable to grazing at all times of the year.

SUPPLEMENT #8

PALATABILITY TABLE

EDITORS NOTE:

(Since it is entirely out of the question to set up any standard figure as to the palatability of forage plants over any extended area, the accompanying list of the more common plants of the ten Western States are listed only to standardize the plant symbols for survey purposes and to further the cause of uniform common names).

GRASSES

Scientific Name	Common Name	Symbol	% C&H	% S&G
	Mixed Grasses	Gr		
Agropyron smithii	Bluestem	Ags		
" pauciflorum	Slender wheat grass	Agp		
" cristatum	Crested " "	Acr		
" spicatum	Blue-bunch "	Asp		
" caninum	Bearded "	Agc		
" repens	Quack Grass	Agr		
Agrostis hiemalis	Winter red top	Ahi		
" palustris	Red Top	Apa		
Alopecurus spp.	Mountain fox tail	Alo		
Andropogon furcatus	Big feather grass	Afu		
" scoparius	Small "	Asc		
Aristida longiseta	Longneedled 3Awn	Arl		
" purpurea	Purple "	Arp		
Aristida arizonica	Arizona 3Awn	Ara		
" bromoides	Annual "	Arb		
" fendleriana	Small "	Arf		
Avena spp.	Wild oats	Ave		
Beckmannia syzigachne	Sloughgrass	Bsy		
Blepharoneuron tricholepis	Beardless bunch	Btr		
Bouteloua aristidoides	6 weeks gramma	Bar		
" barbata	"	Bba		
" curtipendula	side oats	Bcu		
" eripoda	Black gramma	Ber		
" gracilis	Blue gramma	Bgr		
" hirsuta	Hairy gramma	Bhi		
" procumbens	6 weeks gramma	Bpr		
Bromus brizaeformis	Rattlesnake grass	Bbr		
" carinatus (polyanthus, marginatus)	California brome	Bca		
" tectorum	Cheat grass	Bte		
" hordeaceus	Soft cheat grass	Bho		
" inermis	Smooth brome	Bin		
" anomalus (porterii)	Nodding brome	Ban		
Buchloe dactyloides	Buffalo grass	Bda		
Calamagrostis canadensis	Bluejoint	Cca		
" rubescens	Pinegrass	Car		

Scientific Name	Common Name	Symbol	% C&H	% S&G
Catabrosa aquatica	Brookgrass	Caq		
Chaetochloa spp.	Foxtail	Csp		
Dactylis glomerata	Orchard grass	Dgl		
Danthonia spp.	Oatgrass	Das		
Distichlis spp.	Saltgrass	Dis		
Deschampsia atropurpurea	Mountain Hairgrass	Dat		
" caespitosa	Tufted Hairgrass	Dec		
" caryophylla	Silver Hairgrass	Dca		
" elongata	Slender Hairgrass	Del		
Echinochloa crusgalli	Barnyard Grass	Ecc		
Elymus canadensis	Canadian Ryegrass	Elc		
" condensatus	Giant "	Eco		
" glaucus	Western "	Egl		
Epicampes spp.	Tall Deergrass	Eps		
Eragrostis spp.	Stinkgrass	Era		
Festuca arizonica	Arizona fescue	Fea		
" confinis	Spiked "	Fec		
" idahoensis	Idaho "	Fid		
" kingii	Spiked "	Fki		
" octoflora	6 weeks "	Foc		
" ovina	Sheep "	Fov.		
" rubra	Red "	Fru		
" viridula	Green "	Fvi		
" scabrella	Rough "	Fca		
" pacifica	Pacific "	Fap		
Glyceria elata	Tall mannagrass	Gle		
" pauciflora	Weak "	Glp		
" striata	Fowl "	Gls		
Hierochloe odorata	Sweetgrass	Hod		
Hilaria belangeri	Curley mesquite	Hbe		
" jamesii	Galleta grass	Hja		
" mutica	Tobosa grass	Hmu		
" rigida	Big Galleta	Hri		
Hordeum jubatum	Foxtail barley	Hju		
" nodosum	Meadow "	Hno		
Heteropogon contortus	Tanglehead	Hco		
Koeleria cristata	Junegrass	Kcr		
Leptochloa spp.	Sprangle top	Lsp		
Lycurus phleoides	Texas timothy	Lph		
Melica bulbosa	Oniongrass	Mbu		
" spectabilis	"	Mes		
Muhlenbergia montana	Mountain muhley	Mmo		
" dubia	Big "	Mdu		
" virescens	Purple "	Mvi		
" pungens	Spiny "	Mpu		
" gracillima	Ring grass	Mgr		
" porteri	Hoe Grass	Mpo		
" repens	Wire grass	Mre		
" filiformis	Slender muhley	Mfi		
" racemosa	Marsh muhley	Mra		
" squarrosa	Mat muhley	Msq		
Munroa squarrosa	False Buffalo grass	Mus		
Oryzopsis hymenoides	Indian rice	Ohy		
" fimbriata	Pinon rice	Ofi		
" micrantha	Mountain rice	Omi		
Panicum obtusum	Vine panic grass	Pob		

Scientific Name	Common Name	Symbol	% C&H	% S&G
Panicum bulbosum	Bulb panic grass	Pbu		
" capillare	Barbcushioned witchgrass	Pca		
Phalaris arundinacea	Reed canary grass	Par		
Phleum alpinum	Alpine timothy	Pha		
" pratense	Timothy	Php		
Pleuropogon refractus	Semaphore grass	Pre		
Poa spp.	Bluegrass	Poa		
Poa cusickii	Cusick bluegrass	Pcu		
" epilis	Skyline "	Pep		
" gracillima	Slender "	Pog		
" nervosa	Wheeler "	Pna		
" palustris	Fowl "	Ppa		
" pratensis	Kentucky "	Pop		
" reflexa	Nodding "	Pre		
" secunda	Sandbergs "	Pos		
" ampla	Big bluegrass	Pam		
" nevadensis	Nevada "	Pne		
Polypogon monspeliensis	Rabbitfoot grass	Pmo		
Puccinellia nuttalliana	Alkali grass	Pnu		
Schedonnardus spp.	Texas crab grass	Sch		
Scleropogon brevifolius	Burro grass	Scb		
Sitanion hystnix	Squirrel tail	Shy		
" jubatum	Big squirrel tail	Sju		
Sporobolus airoides	Alkali sacaton	Sai		
" cryptandrus	Sand dropseed	Scr		
" contractus	Spiked "	Scs		
" giganteus	Giant "	Sgi		
Stipa comata	Needle and thread	Sco		
" californica	California needlegrass	Sca		
" columbiana	Columbia "	Stc		
" elmeri	Elmer "	Sel		
" lettermani	Lettermans "	Sle		
" minor	Small "	Smi		
" occidentalis	Western "	Soc		
" thurberiana	Thurber "	Sth		
" virdula	Green porcupine grass	Svi		
Triodia spp.	Cotton grass	Tsp		
Trisetum canescens	Tall trisetum	Trc		
" cernuum	Nodding "	Tce		
" spicatum	Spike "	Tsp		
Valota saccharoides	Arizona cotton grass	Vsa		
Stipa robusta	Sleepy grass	Str		

GRASSLIKE PLANTS

Carex atrata	Marsh sedge	Cat
" amplifolia	Sedge	Cam
" douglasii	"	Cad
" filifolia	Nigger wool	Cfi
" geyeri	Elk sedge	Cge
" geophyllia	Dry land sedge	Cag
" laeviculmis	Smooth stem sedge	Cal
" mertensii	Bluestem sedge	Cme
" rossii	Ross sedge	Cro
Cyperus fendlerianus	Nut grass	Cyf

Scientific Name	Common Name	Symbol	% C&H	% S&G
Eguisetum spp.	Horsetail	Egu		
Eriophorum gracile	Slender cotton sedge	Erg		
Juncoides campestre	Woodrush	Jca		
" glabratum	Smooth woodrush	Jgl		
" spicatum	Spike "	Jsp		
Juncus balticus	Baltic rush	Jba		
" bufonius	Toad "	Jbu		
" drummondii	Drummond rush	Jdr		
" regelii	Regel rush	Jre		
" saximontanus	Mountain rush	Jsa		

SHRUBS

Scientific Name	Common Name	Symbol	% C&H	% S&G
Acacia spp.	Catclaw	Acs		
Allenrolfea occidentalis	Burroweed	Aoc		
Alnus tenuifolia	Alder	Alt		
Amelanchier alnifolia	Service berry	Aal		
" oreophila	Mountain service berry	Aor		
" florida	Pacific " "	Afl		
Amorpha spp.	Spice bush	Amo		
Aplopappus heterophyllus	Rayless goldenrod	Aph		
" nanus		Ana		
" greenei	Golden weed	Apg		
" suffruticosus	Singlehead goldenweed	Asu		
Apocynum spp.	Dog bane	Apo		
Arctostaphylos uva-ursi	Kinnikinnick	Auu		
" pungens	Manzanita	Arp		
Artemisia tridentata	Big sagebrush	Atr		
" cana	Silver sage	Arc		
" filifolia	Sand sage	Arf		
" nova	Small sagebrush	Ano		
" frigida (Estafiata)	Winter sage	Afr		
" pygmaea	Desert sagebrush	Apy		
" spinescens	Bud sagebrush	Ars		
" arbuscula	Low "	Aar		
" rigida	Stiff "	Ari		
Atriplex canescens	Chamise	Aca		
" confertifolia	Shadscale	Aco		
" corrugata	Mat salt bush	Atc		
" nuttallii	Nutall salt bush	Atn		
Baccharis pteronioides	Baccharis	Bap		
Cassiope mertensiana	White heather	Cam		
Ceanothus fendleri	Ceanothus	Cef		
" martini	"	Cem		
" gregii	Desert "	Ceg		
" velutinus	Snowbush	Cev		
" sanguineus	Red ceanothus	Ssa		
Cercocarpus ledifolius	Curled leaf mahogany	Cel		
" montanus	Mountain mahogany	Cmo		
Chrysothamnus graveolems	Yellow brush	Cgr		
" lanceolatus	Lance leaf Yellowbrush	Chl		

Scientific Name	Common Name	Symbol	% C&H	% S&G
Chrysothamnus nauseosus	Rubber rabbitbrush	Cna		
" paniculatus	Little "	Chp		
" puberlus	Low rabbitbrush	Cpu		
" speciosus	Tall "	Csp		
" stenophyllus	Desert "	Cst		
" viscidiflorus pumilus	Low "	Cvp		
Coleogyne ramosissima	Black brush	Cor		
Corylus californica	California Hazel	Cca		
Cornus stolonifera	Dogwood	Cos		
Cowania stansburiana	Cliffrose	Cst		
Crataegus brevispina	Hawthorn	Cbr		
" rivularis	"	Crr		
Dasiphora fruticosa	Shrubby cinguefoil	Dfr		
Emplectocladus fasciculatus	Desert almond	Efa		
Encelia spp.	Brittle brush	Enc		
Ephedra nevadensis	Nevada joint fir	Ene		
" torreyana	Torrey joint fir	Eto		
" viridis	Mormon Tea	Evi		
Eriogonum spp.	Buckwheat brush	Eri		
Eurotia lanata	Winter fat	Ela		
Fallugia paradoxia	Apache plume	Fpa		
Fendlera spp.	Fendler brush	Fen		
Forestiera neomexicano	Wild olive	Fne		
Forsellesia spinescens	Grease bush	Fos		
Garrya spp.	Silk tassle	Gar		
Grayia spinosa	Spiny hop sage	Gsp		
Grossularia spp.	Gooseberry	Gro		
Gutierrezia sarothrae	Snakeweed	Gsa		
Kochia vestita	Gray Molly	Kve		
Lepargyrea spp.	Buffalo berry	Lea		
Lonicera spp.	Wild honeysuckle	Lon		
Lycium spp.	Wolfberry	Lyc		
Lygodesmia spinosa	Thorn skeleton plant	Lys		
Menodora scabra	Twin berry	Msc		
Mimosa spp.	Mimosa	Msp		
Nolina microcarpa	Bear grass	Nom		
Odostemon repens	Oregon holly grape	Ore		
" fremonti	Fremonts hollygrape	Odf		
Opulaster malvaceus	Nine bark	Opm		
Opuntia spp.	Cactus	Opu		
Pachystima myrsinites	Myrtle boxleaf	Pmy		
Parosela formosa	Shrubby pea	Paf		
Pediocactus simpsonii	Globe cactus	Psi		
Peraphyllum ramosissimum	Squaw apple	Per		
Polygala subspinosa	Spiny polygala	Psu		
Philadelphus spp.	Mock orange	Phi		
Prosopis glandulosa	Mesquite	Mes		
Ptelea trifoliata	Wafer ash	Ptt		
Prunus spp.	Chokecherry	Pru		
Purshia tridentata	Bitter brush	Ptr		
Quercus gambelii	Gambel oak	Qga		
" turbinella	Turbinella oak	Qtu		
" undulata	Wavey leaved oak	Qun		
" grisea	Grey oak	Qri		
" utahensis	Utah oak	Qut		
Rhamnus spp.	Buckthorn	Rha		

Scientific Name	Common Name	Symbol	% C&H	% S&G
Rhus trilobata	Skunk bush	Rtr		
" cismontana	Sumac	Rci		
" utahensis	Utah sumac	Rut		
Ribes spp.	Wild currant	Rib		
Rosa spp.	" rose	Ros		
Rubus laciniatus	Evergreen blackberry	Rla		
" leucodermis	White bark raspberry	Rle		
" parviflorus	Thimble berry	Rpa		
Salicorna spp.	Glasswort	Ssp		
Salix comutata	Undergreen willow	Sac		
" cordata	Heartleaf "	Sco		
" lasiandra	Western black willow	Sla		
" scouleriana	Scouler willow	Ssc		
Sambucus melanocarpa	Black elderberry	Sme		
" microbotrys Rcd	Elderberry	Sam		
Sarcobatus vermiculatus	Greasewood	Sve		
Sericotheca dumosa	Oceanspray	Sdu		
Simmondsia californica	Coffeeberry	Scf		
Spirea spp.	Spirea	Spi		
Symphoricarpus oreophilus	Snowberry	Sor		
" rotundifolius	"	Sro		
Tamarix gallica	Tamarix	Tag		
Taxus spp.	Yew	Tax		
Toxicodendron rydbergia	Poison ivy	Try		
Tetradymia canescens	Horsebrush	Tca		
" " inermis	"	Tei		
" glabrata	Little leaf horsebrush	Tgl		
" spinosa	Spiny horsebrush	Tsp		
Yucca elata	Soapweed	Yue		
" macrocarpa	Spanish dagger	Yum		
Vaccinium spp.	Huckleberry	Vac		
Viburnum pauciflorum	Rayless cranberry bush	Vpa		
	Mixed Browse	Brs		

FORBS (WEEDS)

Scientific Name	Common Name	Symbol	% C&H	% S&G
Abronia spp.	Sandverbena	Abr		
Achillea lanulosa	Yarrow	Ala		
Aconitum spp.	Monkshood	Aco		
Actaea arguta	Baneberry	Aca		
Actinea richardsonii	Rubberweed (Pingue)	Act		
Adenostegia ramosa	Plumeweed	Ara		
Agastache urticifolia	Horsemint	Aur		
Agoseris spp.	False dandelion	Ago		
Allenrolfea occidentalis	Pickleweed	Alo		
Allium spp.	Wild Onion	All		
Alsine jamesiana	Chickweed	Aja		
Alsine spp.	"	Als		
Amaranthus blitoides	Pigweed	Amb		
Amaranthus spp.	"	Ama		
Anaphalis spp.	Pearly everlasting	Ana		
Androsace spp.	Androsace	And		
Angelica wheeleri	Angelica	Awh		
Anogra pallida	White evening primrose	Anp		
Antennaria spp.	Pussy toes	Ant		
Aplopappus spp.	Burroweed	Apl		
Apocynum spp.	Dogbane	Apc		
Aquilegia spp.	Columbine	Aqu		
Arabis spp.	Rock cress	Ais		
Arenaria spp.	Sand wort	Are		
Argemone spp.	Prickly poppy	Arg		
Arnica cordifolia	Heartleaf arnica	Aco		
Arnica fulgens	Arnica	Afu		
Artemisia dracunculoides	False tarragon	Adr		
" gnaphalodes	Cudweed sage	Agn		
" incompta	Sweet sage	Aia		
" ludoviciana	"	Ald		
" michauxiana	"	Arm		
Asclepiadora decumbens	Spider milkweed	Ade		
" speciosa	Milkweed	Asl		
Asclepias gallioides	Whorled milkweed	Aga		
Aster spp.	Aster	Ass		
Astragalus spp.	Loco	Ast		
Atriplex (annual spp).	Annual salt bush	Atx		
Aulospermum longipes	Fluted seed	Auo		
Bahia dissecta	Yellow ragweed	Bdi		
Balsamorhiza sagittata	Arrowleaf balsamroot	Bsa		
" hookeri	Cleft-leaf "	Bho		
Blitum capitatum	Pigweed	Blc		
Brassica spp.	Mustard	Bra		
Bursa bursa pastoris	Shepherds purse	Bbr		
Calochortus spp.	Mariposa or Sego lily	Clo		
Caltha leptosepala	Marsh marigold	Clp		
Campanula spp.	Harebell	Cam		
Capnoides montanum	Corydalis	Cmm		
Cardamine cordifolia	Bittercress	Ccf		
Carduus spp.	Bull thistle	Car		

Scientific Name	Common Name	Symbol	% C&H	% S&G
Castilleja spp.	Indian Paintbrush	Cas		
Caulanthus spp.	Wild cabbage	Cau		
Cerastium spp.	Chickweed	Cer		
Chaenactis douglasii	False yarrow	Cdo		
Chamaenerion angustifolium	Fireweed	Cha		
Cheirinia spp.	Wall flower	Chn		
Chenopodium spp.	Goosefoot	Che		
Chlysmia spp.		Chy		
Chrysopsis breweri	Golden aster	Cbr		
Cicuta occidentalis	Water hemlock	Coc		
Cirsium spp.	Thistle	Cir		
Claytonia spp.	Spring beauty	Cla		
Clematis columbiana	Virgins bower	Cco		
Clematis hirsutissima	Clematis	Chi		
Cleome lutea	Yellow beeplant	Clu		
Cleome serrulata	Rocky Mtn.beeplant	Cse		
Cogswellia spp.	Parsley	Cog		
Collinsia tenella	Bluelip	Cte		
Collomia linearis	Collomia	Col		
Comandra pallida	Toadflax	Cpa		
Convolvulus minima	Wild morning glory	Cmi		
Crepis spp.	Hawksbeard	Cre		
Cryptanthe spp.	Cryptanthe	Cry		
Cymopteris spp.	Cymopteris	Cym		
Delphinium spp.	Tall larkspur	Dsp		
" menziesii	Low "	Dme		
Dodecatheon spp.	Shooting star	Dod		
Dondia spp.	Seepwood	Don		
Dondia nigra	Black seepweed	Dni		
Draba spp.	Draba	Dra		
Drymocallis spp.	Cinquefoil	Dry		
Epilobium spp.	Willowherb	Epi		
Erigeron spp.	Daisy	Eri		
Eriogonum spp.	Eriogonum	Ero		
Erodium cicutarium	Alfileria	Eci		
Erysimum officinale	Hedge mustard	Eof		
Erythronium parviflorum	Dogtooth violet	Erp		
Euphorbia spp.	Drymocallis	Eup		
Fragaria platypetala	Strawberry	Fpl		
Franseria acanthicarpa	Ragweed	Fac		
Frasera albo marginata	White edged elkweed	Fal		
Frasera speciosa	Elkweed	Fsp		
Fritillaria atropurpurea	Spotted Fritillary	Fat		
Fritillaria pudica	Yellowbell	Fpu		
Gaillardia gracilis	Gaillardia	Ggr		
Galium spp.	Bedstraw	Gal		
Gayophytum spp.	Kitchenweed	Gay		
Gentiana spp.	Gentian	Gen		
Geranium fremontii	Geranium	Gfr		
" viscosissimum	Hairy geranium	Gvi		
Geum spp.	Avens	Geu		
Gilia spp.	Gilia	Gil		
Glycyrrhiza lepidota	Licorice	Gle		
Gnaphalium spp.	Cudweed	Gna		
Grindelia squarrosa	Gumplant	Gsq		
Habenaria unalascensis	Wood orchid	Hau		

Scientific Name	Common Name	Symbol	% C&H	% S&G
Hedioma nana	Penny royal	Hna		
Hedysarum cinerascens	Sweetvetch	Hci		
Helenium hoopesii	Sneezeweed	Hho		
Helianthella uniflora	One-flowered sunflower-Hun			
Helianthus spp.	Sunflower	Hel		
Heracleum lanatum	Cow-parsnip	Hla		
Heuchera spp.	Alumroot	Heu		
Hieraceum scouleri	Woolyweed	Hsc		
" carncum	"	Hca		
Hookera douglasii	Umbel lily	Hdo		
Hydrophyllum capitatum	Waterleaf	Hca		
Hymenopappus spp.		Hym		
Hypericum spp.	St. Johns wort	Hyp		
Iris missouriensis	Rocky Mtn. Iris	Imi		
Iva axillaris	Iva	Iax		
Lactuca spp.	Wild lettuce	Lsp		
Lappula spp.	Stickseed	Lap		
Lathyrus spp.	Wild peavine	Lat		
Lavauxia flava	Yellow evening primrose-Lav			
Leontodon taraxacum	Dandelion	Lta		
Lepidium spp.	Peppergrass	Lep		
Leptodactylon caespitosum		Lcm		
Leptotaenia multifida	Indian Balsam	Lmu		
Lesquerella spp.	Bladderpod	Les		
Leucelene spp.	Heath aster	Leu		
Ligusticum spp.	Loveroot	Lig		
Linum spp.	Flax	Lin		
Lithophragma parviflora	Woodland star	Lpa		
Lithospermum spp.	Stoneseed	Lit		
Lotus spp.	Trefoil	Lot		
Lupinus spp.	Lupine	Lup		
Lygodesmia juncea	Skeletonweed	Lyg		
Madia glomerata	Tarweed	Mgl		
Madronella spp.	Mint	Mad		
Malva rotundifolia	Buttonweed	Mro		
Malvastrum spp.	False Mallow	Mal		
Marrubium vulgare	Hoarhound	Mvu		
Medicago lupulina	Black Medic	Mlu		
Melampodium lencanthum	Woody aster	Mle		
Melilotus alba	White sweet clover	Mea		
Melilotus officinalis	Yellow "	Mof		
Mentha spp.	Mint	Men		
Mentzelia spp.	Stickleaf	Mza		
Mertensia spp.	Bluebell	Mer		
Mimulus spp.	Monkey flower	Mim		
Monarda spp.	Bee balm	Mon		
Monolepis spp.	Monolepis	Mos		
Nicotiana spp.	Wild tobacco	Nic		
Norta altissima	Tumble mustard	Nal		
Oenothera marginatus	Evening primrose	Oma		
Oreocarya spp.	Hairy leaf	Ora		
Orthocarpus spp.	Owls clover	Ort		
Osmorhiza spp.	Sweet cicely	Osm		
Oxalis spp.	Sheep sorrel	Oxa		
Oxytropis spp.	Loco	Oxy		
Pachylophus spp.	Fragrant evening primrose-Pas			

Scientific Name	Common Name	Symbol	% C&H	% S&G
Parosela spp.	Prairie clover	Par		
Pedicularis spp.	Elephant head	Ped		
Pentstemon spp.	Pentstemon	Pen		
Phacelia spp.	Phacelia	Pha		
Phlox spp.	Phlox	Phl		
Physaria didymocarpa	Double Bladder pod	Pdi		
Plantago spp.	Plantain	Pla		
" wegron	Indian wheat	Plw		
Polemonium spp.	Skunkweed	Pol		
Polygonum spp.	Knotweed	Ply		
Portulaca spp.	Pursley	Prt		
Potentilla spp.	Cinquefoil	Pot		
Pseudocymopterus montanus	False carrot	Psm		
Psoralea spp.	Wild alfalfa	Pso		
Pteridum spp.	Bracken fern	Pte		
Pulsatilla ludoviciana	Pasque flower	Plu		
Quamasia quamash	Camas	Qqa		
Ranunculus spp.	Buttercup	Ran		
Rudbeckia occidentalis	Niggerhead	Roc		
Rumex spp.	Dock	Rum		
Salsola pestifer	Russian thistle	Spe		
Saxifraga spp.	Saxifrage	Sax		
Schoencrambe spp.	Plains mustard	Sch		
Scrophularia spp.	Figwort	Scr		
Sedum spp.	Stone crop	Sed		
Senecio spp.	Butterweed	Sen		
" triangularis	Groundsel	Str		
" serra	"	Sse		
Sidalcea spp.	Prairie mallow	Sid		
Sieversia ciliata	Old mans whiskers	Sic		
Silene spp.	Catchfly	Sil		
Sisyrinchium	Blue-eyed grass	Sis		
Solidago spp.	Goldenrod	Sol		
Sophia spp.	Tansy mustard	Sof		
Sphaeralcea spp.	Globe mallow	Sps		
Stanleya spp.	Stanleya	Sta		
Stachys ciliata	Fringed hedgenettle	Sci		
Thalictrum spp.	Meadow rue	Tha		
Thermopsis spp.	Golden pea	The		
Thlaspi spp.	Fanweed	Thl		
Tithyalmus spp.	Spurge	Tit		
Townsendia spp.	Townsendia	Tow		
Tragia ramosa	Nettle	Trr		
Trapopogon spp.	Salsify	Tra		
Trifolium spp.	Clover	Tri		
Urtica spp.	Stinging nettle	Urt		
Vagnera spp.	False Solomons seal	Vag		
Valeriana spp.	Valerian	Val		
Veratrum spp.	False hellebore	Ver		
Verbascum thapsus	Mullein	Vth		
Verbena spp.	Verbena	Vrb		
Veronica spp.	Speedwell	Vra		
Vicia spp.	Vetch	Vic		
Viguieria multiflora	Many flowered sunflower	Vmu		
Viola spp.	Violet	Vio		
Wyetheia amplexicaulis	Mulesear dock	Wam		
Xanthium spp.	Cocklebur	Xan		
Zygadenus spp.	Death camas	Zyg		

Supplement 9
Range Survey
Progress Report

Month of ________ 1938

RANGE EXAMINERS MONTHLY REPORT

____
Signature Title

____
State Grazing Dist. Camp

1. National Range Survey: Method or standard used ________________
   (a) Field Surveys: Topographic, Range Types, Water, Erosion, Special, Location (land, improvements, etc.) No. days ________ Area or Mileage ________
   (b) Office compilation: Drafting, planimetering, Statistical computation, Record compilation, Reports. No. days ________ Area or Mileage ________

2. Dependent Property Inventory: Method or standard used ________________

	No. days	No. cases completed	No. cases pending
(a) Field			
Inspections	________	________	________
Interviews	________	________	________
(b) Office			
Land Status Records	________	________	________
Reports	________	________	________
Record Compilation	________	________	________

   (c) Accumulative Record
   Total cases assigned ____________ Total cases completed ________

	Days--Field	Days--Office
3. ECW Camp Projects: (Specify)	________ ________	________ ________
4. Administrative Assignments: (Specify)	________ ________	________ ________
5. Special Assignments: (Specify)	________ ________	________ ________
6. Miscellaneous: (Specify)	________ ________ ________	________ ________ ________

7. Enrollee Participation:

	No. Men	No. Days
(a) Direct Supervision		
Field work	________	________
Office work		
(b) Indirect Supervision		
Field work	________	________
Office work	________	________

Bureau of Land Management
Library
Bldg. 50, Denver Federal Center
Denver, CO 80225